FOREIGN BIRDS

FOR CAGE AND AVIARY.

(PART II)

A. G. BUTLER.

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FOREIGN BIRDS

FOR CAGE AND AVIARY.

BY

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PART II.

THE LARGER FOREIGN BIRDS.

ILLUSTRATED.

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PREFACE.

THE present volume finishes my account of the cage-birds imported into the European bird markets, and is, so far as I have been able to make it, complete up to the end of the year 1908. In the case of the Doves and some other groups, I believe it to be complete up to the end of 1909. It represents, in fact, a series of monographs of known cage-birds, any one of which, if printed in large type and illustrated fully by scientifically correct coloured plates, would form a handsome volume.

In the preparation of the present work I have spared no trouble in indicating the affinities of the various groups, as worked out by systematic ornithologists, feeling that hitherto aviculturists generally have given technical workers too much cause to accuse them of apathy respecting what has been regarded by many as the scientific side of ornithological study. As a matter of fact, the study of bird-life is every whit as scientific as that of the classification of birds, and for one section of workers to look down upon and ignore the labours of the other is the height of folly, and exposes all who indulge in such an attitude to the charge of wilful ignorance. Before leaving this subject, I feel bound to call attention to the incalculable mischief which is being done to science by the misguided efforts being continually made by short-sighted agitators to hinder the work of aviculturists under the cloak of humanitarianism.

Bird protection, in so far as it puts a stop to the shooting down of every rare bird which approaches our shores, or to the wicked slaughter of sea-birds by trippers with guns, and more particularly in its efforts to put a stop to the iniquitous traffic in bird skins and plumes for the adornment of hats and bonnets, is an excellent institution; but when, not content with this good work, it strives to do away with the study of birds in cage and aviary, it becomes at once an evil thing for which posterity will have just cause to curse its advocates.

Bird-life can only be partially studied by the field naturalist owing to the skulking nature of many birds, and their amazing cunning in, not only concealing their nests, but in enticing the investigator from the neighbourhood of the same; of such birds the habits can only be studied in aviaries, and any seeker after self-advertisement who strives to prevent such means of acquiring knowledge is an offender both against God and man, and deserving of the severest punishment.

In the twenty chapters I have treated of the following groups of birds:—New- and Old-world Starlings, Bower-birds, Paradise-birds, Manucodes, Crows, so-called Piping Crows or Crow-Shrikes, Larks, Pittas, Tyrants, Chatterers, Oven-birds, Woodpeckers, Colies, Kingfishers, Motmots, Bee-eaters, Toucans, Barbets, Touracous, Parrots, and Doves. The last two groups have been so extensively imported that they occupy no less than thirteen of the twenty chapters in the volume.

As before, I have endeavoured in each group to give an account of the wild life, and of the food generally regarded as most suitable for rendering the lives of its members healthy and happy in captivity. I now proceed to give, as before, for the benefit of those who desire to study aviculture more intimately, a list of the works quoted in the present volume, most of which are in my own library.

In this and the preceding volume I have described about a thousand species of cage-birds.

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Foreign Birds for Cage and Aviary.

PART II.

INTRODUCTION.

I commence this portion of my work with less confidence and satisfaction than when I started upon Volume I., because, in some of the groups to be dealt with, I have not been brought into personal contact with any of the species, and in others I have only kept one or two;* nevertheless, since I wrote Part II. of "Foreign Bird-Keeping," a good deal of additional information has been published respecting the habits of these birds, both at liberty and in captivity; and, when one can quote the experiences of other trustworthy observers, it is almost as satisfactory to oneself, and certainly quite as much so to one's readers, as if one described what one had personally observed.

Since the smaller book appeared, birds formerly regarded as of extreme rarity in private collections have been much more freely imported; so that, in a general work upon the imported Foreign Cage-birds, it is no longer possible or advisable to pass them over. In the case of the Humming Birds, though a good many have been imported, none have lived long enough to render them popular, and the general opinion seems to be that they will never be suited to aviary-life in this bleak and often sunless country. I think myself that a judicious selection of those species which occur at great altitudes, where cold and snow are by no means unknown, might readily be acclimatised here, provided that the birds could be induced to feed upon some rational soft food, instead of the quaint combination of beef-tea and syrup hitherto provided for them. Anyhow, as matters stand, I see no utility in including Humming Birds in the present work; but the Bower Birds, Paradise Birds, Crows, Pittas, Woodpeckers, Colies, Kingfishers, Toucans, Barbets, and Touracous can no longer be ignored.

The question is whether it is correct to regard any of the Game-birds, however small, as cage-birds; that they have been exhibited in cages at bird-shows cannot be accepted as evidence, because the same is true of Rails, Plovers, and various birds of prey. I think myself that it would be more correct for the smaller Game-birds to be included with the larger, and the Rails, Plovers, etc., in a separate work prepared by someone specially qualified to write upon them. It seems to me to be absurd to regard those birds as cage-birds which nobody ever keeps in a cage. It may be argued that, as a general rule, Doves are kept in aviaries; this is undoubtedly true, but it is by no means unusual to see a pair in a large cage, and some of them may even be bred in such an enclosure.

As in Vol. I. the Finches occupied the greater portion of the text, so in Vol. II. the lion's share falls to the Parrots. Most of the species described are of large size, and therefore (excepting in the case of the Doves, which sometimes scare, but never injure, birds of other orders) are for the most part more suitable for cages or moderate sized flights than for aviaries; unless a man be wealthy enough to devote an aviary to each type.

In the case of the Starlings, they become much tamer and are far more engaging when kept in cages than in aviaries; in the latter, with smaller birds, some of them are inclined to be aggressive, as the Crows always are; the Larks, if kept for their song, are far better caged; the Sulphur Tyrant can only be trusted with birds as powerful as himself; the Parrots, unless intended to breed, should all be kept in separate cages.

As with the species treated of in Vol. I., the insectivorous feeders are undoubtedly the most interesting, but they also occupy the bulk of the time which can be devoted to one's pets, owing to the necessity of daily preparing fresh soft food for them; the Parrots are perhaps the most popular, on account of their startling colours and the power of speech which many of them possess; but, until acclimatised, they are liable to go off with lung trouble, cramp, or inflammation of the liver or bowels, the latter being usually due to improper feeding upon sloppy messes and animal food. It is true that one group of Parrots (the Lories and Lorikeets) appears to thrive, at any rate for a year or two, upon a diet which would speedily prove fatal to most other Parrots, but I am not at all sure that even these would not be far better if they could be confined to a less sloppy diet with the addition of plenty of soft fruit: Canon Dutton suggests scalded fig mashed up with bun.

For anyone not particularly anxious for song, but with a keen eye for colour, the Doves are by far the best birds to take up. I must have both, and therefore it has been necessary for me to keep all kinds of cage-birds. Nevertheless, I find Doves very charming, not because they are reputed to be harmless, and *are* to other birds—for among themselves, with the exception of the African Bronzewings, which are always amiable, they are the most vindictive of all birds, not only plucking out feathers wholesale, but doing their utmost to pull out one another's eyes if pairs of several species are kept together. This, however, happens chiefly during the breeding season, for at other times most of these birds are absolutely apathetic.

In the case of illness, prevention is better than cure; treat your birds properly; feed them correctly, and as the rustics say, "they'll live till they die, if nobody don't kill 'em"; but if you begin to take up with fads, and reject certain excellent foods because, under certain conditions, they may be suitable for the cultivation of injurious micro-organisms, you will only have yourselves to thank if your birds die young. One thing cannot be too often repeated, and that is, in the case of any indisposition in an insectivorous bird, the finest medicine consists of two or three garden spiders; if you cannot get these, look in boxes and pots for hunting spiders.

* Of the Starlings, however, with which this volume begins, I have had a fair number of species.

CHAPTER I.

NEW-WORLD STARLINGS (*Icteridæ*).

These birds are a link between the Ploceine Weavers and the Old-World or typical Starlings. Professor Ridgway, however, does not agree with this view of their affinities, but observes: "The absence of obvious rictal bristles is the only external character that I am able to discover which will serve to distinguish the *Icteridæ*, as a group, from the *Fringillidæ*." As usual, he makes a great point of the possession of only nine obvious primaries, though I would venture to say that if all the primary-coverts were removed from a series of *Fringillidæ*, *Ploceidæ*, and *Icteridæ*, the tenth primary would be as obvious in one group as another, this little quill being always well marked in *Passer* and other genera of the *Fringillidæ*, as well as in every Icterid bird which I have examined, though shorter than its coverts.

Ridgway correctly says ("Birds of North and Middle America," Vol. II., p. 172): "The *Icteridæ* comprise birds of most various habits. Some are strictly arboreal, and if placed upon the ground are almost incapable of progression; others are terrestrial (though more or less frequently alighting on trees and sometimes nesting there), and walk upon the ground with the grace and dignity of a Crow or Starling.* Many inhabit reedy marshes, and these usually nest in large colonies. The Oropendolas (genera *Ocyalus*, *Clypicterus*, *Zarynchus*, *Gymnostinops*, and *Ostinops*) and Caciques (genera *Cacicus* and *Cassiculus*) also nest in colonies, but instead of building an open, cup-shaped nest attached to the upright stems of aquatic plants, attach their long, pensile nests to the extremities of branches of tall forest trees. The 'American Orioles' (genus *Icterus*) also build pensile nests, but, usually at least, are not gregarious. Many species are remarkable either for the fulness and richness or other remarkable character of their notes, some of them being songsters of high merit, while others utter only the most harsh and discordant sounds. Some genera (*Molothrus*, *Callothrus*, and *Cassidix*) are parasitic, like the European Cuckoo, always laying their eggs in the nests of other birds." He does not mention, at this point, that the Bobolink (which possesses a very Finch-like outline of bill in both sexes) has distinct summer and winter plumages, after the fashion of the Whydahs and Weavers among the *Ploceidæ*. Some of the glossy Troupials (the American Grackles) nest occasionally, the Chopi usually, in holes, like our European Starling.

Meadow Starlings and Marsh-Troupials (*Agelænidæ*).

BOBOLINK (*Dolichonyx oryzivora*).

The male in breeding plumage is black, the nape sandy-buff, a patch on the side of the breast, the scapulars and rump white, the latter shading into pale ash on the lower mantle and upper tail-coverts; the outer primaries edged with yellowish-white, the tips of the tail feathers edged with pale brownish-ash. In the winter plumage it is buffish-brown, mottled and broadly streaked with black, chiefly on the head and mantle; wing and tail-feathers blackish, with buffish-brown borders, the primaries, however, narrowly edged externally with sordid white; under surface brownish-buff, with lateral blackish stripes; centre of abdomen whiter; beak and feet fleshy horn-brown; iris brown. Female very like the male in winter plumage, but smaller; yellowish-brown, with blackish markings above; yellowish-buff, with blackish streaks on the flanks below; her bill is weaker, more truly conical (less swollen at the sides) when viewed from above, and of a reddish-brown colour. Hab., North and Central America and the West Indies, extending southwards as far as the Argentine Republic, whence I imported a male example in July, 1893.

This bird, in its change of plumage, vaguely resembles the Fire Weavers of Africa, but is larger and altogether feebler in colouring.

When it first arrives in North America in the spring it wanders about in small flocks, apparently consisting of males only, the females probably being concealed in the herbage. Even when paired these birds appear to be gregarious, many pairs building in the same meadow. The nest is built on the ground, generally concealed by grass and wild flowers in meadow-land; it is strongly formed of flexible bents, is shallow, and contains from five to six dull whitish eggs, marked with reddish-brown and lavender spots and blotches.

Ridgway says that the song of the Bobolink is "exquisitely musical," and Mrs. Olive Thorne Miller observes: "Everybody has tried his hand at characterising this bird's incomparable song, but no one has fully expressed it, for words are not capable of it." I am fain to believe that these excellent observers were convinced of the truth of what they wrote, and yet it is hardly conceivable that the same bird should sing deliciously when at liberty and execrably in captivity; it is not so with our British birds.

One of the most popular favourites in North America, the Bobolink yet has little to recommend it as a cage-bird, being neither gorgeous in plumage nor remarkable in captivity for its vocal acquirements; the boasted beauty of its song is, I believe, based upon the patriotic fancy of those who love it—indeed, it belongs to a group of birds barely equal, as singers, to our English Starling. My bird always sang as follows: "*Toong-toong took terook*," and then went off into a rattling gabble of the most excruciating stopper-screwing, uttered (as Audubon rightly states) "with a volubility that even borders upon the burlesque and the ludicrous."

The Bobolink, when freshly imported, is not happy in a cage, and is rather nervous, though less so than most of the Meadow Starlings in an aviary; it naturally feeds on seeds of weeds and insects; in captivity, canary, millet, paddy rice or oats and insects keep it in health. My bird unfortunately died from inflammation of the lungs during its change to summer plumage in March, 1894.

RED-BREASTED MARSH-BIRD (*Leistes superciliaris*).

In its summer plumage it is glossy black, with pale brown eyebrow stripe extending back to the nape; the bend of the wing and body below, from the chin to the middle, crimson; the beak black; the feet horn-brown; the iris brown. In the winter the feathers of the upper parts are mostly bordered with golden brown, but the outer wing-coverts and flank-feathers with ash; all the feathers of the underparts are broadly fringed with ash and the beak becomes paler; it thus becomes a little more like the female, which is pale brown above, varied with black below, with the breast stained with red, the flanks and posterior half of abdomen streaked with black; the tail ashy-brown, barred with black; bill brown, and more slender than in the male, if viewed in profile. Hab., Brazil, Bolivia, and the Argentine

* I have, however, always considered the niggling, uncertain method of walking adopted by Starlings particularly undignified; they never seem to know where they will place the next step, and are diverted by the veriest trifles. Crows also often indulge in most undignified and ungainly lateral hops.

Republic, whence I imported a male in 1893. Like the Bobolink, it is a migratory bird, and in its method of nesting and the colouring of its eggs, of which, however, four seems to be the normal number, it seems nearly to approach that bird, as also in the rapid part of its song: excepting when paired, also, the males and females travel in different small flocks. Hudson describes the song as follows:—"At intervals of two or three minutes he soars vertically up to a height of twenty or twenty-five yards to utter his song, composed of a single long, powerful, and rather musical note, ending with an attempt at a flourish, during which the bird flutters and turns about in the air; then, as if discouraged at his failure, he drops down, emitting harsh guttural chirps, to resume his stand."

The flourish described by Mr. Hudson consists of a number of short, rapid, stopper-screwing, and scissor-grinding notes, which are anything but musical; happily they do not last long. The best part of the song, which I noted as my bird sang, was as follows:—"*Tetser-ur-ching, tetser-ur-ching, tik-kerichard; the ching* was very metallic, as is the *toong-toong* in the song of the Bobolink.

At first sight one would take this bird for a Military Troupial, of which it is almost an exact copy, only the form of the beak is Weaver-like.

When alarmed in an aviary, I noticed that both this bird and the Military Starling crouched low down on the earth, evidently trying to conceal the brilliant crimson on their throats and breasts. The Red-breasted Marsh-bird seems to be essentially a ground species, very rarely perching, and only flying up to sing or when suddenly startled.

THE RED-BREASTED MARSH-BIRD.
(*Male in Winter Plumage.*)

In a cage the Red-breasted Marsh-bird is a misery to himself and a source of irritation to the owner, for he is the wildest and most nervous bird I ever had. In an aviary, however, he is far happier, especially if supplied with plenty of cockroaches, of which he is inordinately fond. He should have the same seeds as the Bobolink.

GUIANA MARSH-BIRD (*Leistes guianensis*).

Male brownish-black; bend of wing and under-surface of body to the middle of the abdomen scarlet. Female above pale brown, varied with black; tail ashy-brown, with black transverse bands; below pale brown; the middle of breast and abdomen washed with scarlet; flanks, lower abdomen and vent streaked with black. Hab., Veragua and southward over Colombia, Venezuela, Trinidad, Guiana, and Amazonia. (P. L. Sclater.)

Between the years 1879 and 1884 Mr. Henry Whitely obtained this species on Mount Roraima at an elevation of 3,500 feet (*cf. The Ibis*, 1885, p. 218).

Dr. Emil A. Goeldi (*The Ibis*, 1897, p. 164, says:—"In the low campos-grass behind the 'sitio' I was much pleased to meet with the splendid *Leistes guianensis*, with its bright crimson breast-cloth; it is called "Témtém do Espirito santo" or "Policia Ingleza," alike, over all Lower Amazonia."

Mr. W. L. S. Loat (*The Ibis*, 1898, p. 562) observes:—"The 'Robin' (*Leistes guianensis*) is common in the fields and pastures of the colony. It has a peculiar habit of flying up into the air to the height of about twenty-five feet; then, drawing its wings close to its side, it shoots obliquely downward, uttering a loud, chirping kind of song, whether done from exuberance of spirits or to charm its mate, which is generally somewhere near, I cannot say. The crimson breast of an adult male is of a most beautiful tint, and is well shown when he performs this aerial movement."

That is all that I can discover respecting the wild life, but it probably corresponds pretty closely with that of *L. superciliaris*, which has been very fully described by Mr. Hudson in the "Argentine Ornithology."

Mr. E. W. Harper imported specimens of this species in 1906, and presented two to the London Zoological Society; a third became the property of Mr. W. T. Page, and there were probably others. These specimens were spoken of under the same trivial name as the Argentine bird, which is confusing; I have therefore omitted the words Red-breasted, and included the word Guiana. (In the Zoological Society's List the name stands "Red-breasted Guiana Marsh-bird," which is too long.)

YELLOW-HEADED MARSH-BIRD (*Xanthocephalus xanthocephalus*).*

Black; a conspicuous white patch on the upper wing-coverts; head all round, fore-neck and breast, orange-yellow; lores, orbital region, front of cheeks and chin, black; anal tuft yellow; irides brown; whole length 9 inches. Female much smaller; sooty-brown; no white wing patch; the yellow on head duller buffish, and confined to the eyebrow, sides of head and breast, the latter more ochraceous; chin and throat whitish, orange behind; breast mottled brownish, yellow at sides; chest and abdomen brown, streaked with whitish; anal tuft yellowish; bill smaller and more slender; irides brown. "Hab., Prairies of North America, from California and the Saskatchewan down to Southern Mexico" (P. L. Sclater). "Florida, Cuba, and even to Greenland." (Ridgway.)

J. G. Cooper observes ("Ornithology of California," p. 269): "They associate in flocks with the other Blackbirds, but also keep in separate bands, and fly with such regularity that their yellow heads often show all at once as they wheel in their aerial evolutions. Sometimes also the sexes fly in separate flocks before the pairing season. They are very gregarious even in spring and summer, and seem to build in company. The only song the male attempts consists of a few hoarse, chuckling notes and comical squeakings, uttered as if with a great effort to make any noise at all. Though some kept about the marsh at Santa Barbara, in which were the nests of the Red-wings, I could not find theirs. According to Heermann, the nest is composed of dry reeds and grasses, attached to the upright stalks of

* This is the name first given to the species, and Professor Ridgway has rightly restored it; Dr. Sclater disapproved of the duplication and called the species *longipes*.

the reeds, and firmly fixed by pieces twisted around them. The eggs, four in number, were pale ashy-green, thickly covered and minutely dotted with points and spots of light umber brown. Nuttall describes the eggs as nearly similar, bluish-white, covered all over with minute specks of brownish-purple, largest and most numerous at the greater end. He says, however, that the nest found by Townsend near the Platte River, on the edge of a grassy marsh, was on the ground, under a tussock formed of fine grasses and canopied over like that of the Meadow Lark (*Sturnella*). As there are no reeds there, the bird may vary its mode of building to suit circumstances."

Russ says that this is a beautiful bird, but has little significance for us because it is too rare in the trade and only arrives singly. He, however, appears to have secured a pair in 1892, which he only possessed for a short time. It has been exhibited at the London Zoological Gardens.

Red-shouldered Meadow-Starling (*Agelæus phœniceus*).

Male glossy black; lesser wing-coverts crimson, more or less bordered with ochraceous on median coverts; bill and feet black; irides brown. Female much smaller; brown, with conspicuous black shaft-streaks; eyebrow white; under surface pale buffish, the abdomen white, all the feathers conspicuously streaked with black; chin buff or reddish; bill smaller and shorter than in the male. Hab., North and Central America, down to Costa Rica. (P. L. Sclater.)

Ridgway splits up this species into eight sub-species on slight local modifications of size, and length of bill, for the most part.

This is the so-called "Blackbird" of the United States.

In its natural state this Meadow-Starling is a marsh-frequenting species; it invariably nests either on the borders of streams or in low, swampy places, such as submerged meadows; low bushes among thick reedy tussocks are usually selected as the site for the nest, but occasionally it is placed on the ground, or, again, rarely, in trees at a height of as much as 20ft. from the ground. Like that of the Baltimore Oriole, it is suspended: the outer framework is usually composed of rushes and stout iris leaves, carefully and firmly interwoven with or fastened round the adjacent twigs; within the framework a mass of coarse materials, such as bleached "eel-grass," etc., is packed, and this again is lined with finer grasses and sedges. The eggs are oval, light bluish in colour, lined, blotched, and marbled with markings of light and dark purple and black. This species is much persecuted in America on account of the mischief which it does to the fields of grain, which is attacked at its unripe stage whilst still soft. After it has hardened, the Red-shouldered Starling is less eager for it; in the old rice, buckwheat, or grain fields he finds abundance of food. According to Ridgway, the notes of this bird "are very varied, the most common one sounding like *con-cur-ee*, but there is also an almost endless mingling of guttural, creaking, or clear utterances that defy description." He quotes an interesting account from Wilson, who, when passing through the lower counties of Virginia in January, frequently witnessed the aerial evolutions of great bodies of this Starling. "Sometimes they appeared as if driven about like an enormous black cloud carried before the wind, varying every moment in shape. Sometimes they rose up suddenly from the fields with a noise like thunder, while the glittering of innumerable wings of the brightest vermilion amid a black cloud occasioned a very striking effect. At times the whole congregated multitude would suddenly alight in some detached grove and commence one general concert, that he could plainly distinguish at the distance of more than two miles, and when listened to at a distance of a quarter of a mile the flow of its cadences were grand, and even sublime."

A charming account of the habits of this bird is given by that fascinating American writer, Mrs. Olive Thorne Miller, in her book entitled "Bird Ways," pp. 95-108. As is well known, it is a bird of the marsh; indeed, one of its American names is "Swamp Blackbird." Its nest, according to Mrs. Miller, is placed low among the reeds; she describes its sidling method of moving along a branch and its heavy jump to the next bough, which at once indicate its Starling affinities. The song, which is usually ridiculed, Mrs. Miller rather admires; she describes it as "*h'wa-kerēē*! *chack, chack*! (scream) *ēē-ūū*! *chack, chack*! (scream) *chick, chick*! *ēē-ūū*! *h'wa-ker-ēē*! (scream), and so on for fifteen minutes or more without pause." A very amusing account is given of a caged bird which was quite tame in the presence of its owner, but became wild at the approach of gentlemen.

According to Russ, "one of the most abundantly, annually, and regularly seen of Starlings in the market," yet in London I never saw a single living specimen offered for sale. I suspect, therefore, that it was formerly imported into this country, but proved intractable, was priced too high, and consequently its sale was so small as to discourage its importation."

In captivity I should certainly feed this bird on seeds, or on insectivorous food, mixed with stale breadcrumbs, and potato, passed through a masher. I should also add mealworms or any other small insects, for I know of no Starling which does not eat some insect food.

Brown-headed Meadow-Starling (*Agelæus frontalis*).

The male is glossy blue-black, the crown and throat chestnut, beak and feet black, iris chestnut. The female is olivaceous brown, with blackish shaft-streaks, beneath paler, the streaks more slender, the throat and breast buffish, beak smaller and rather weaker. Hab., Cayenne and Eastern Brazil.

According to Burmeister ("Systematische Uebersicht," III., p. 267), this bird "keeps in the bush on the banks of rivers, and feeds not only on insects, but also on seeds."

I have come across no other field-notes relating to *A. frontalis*, but it is probable that it nests on the ground in moist localities; it is, in fact, often called "Brown-headed Marsh Troupial."

In outline both of body and beak it closely resembles the Silky Cow-bird, and I do not think it ought to be placed in the same genus with the Yellow-shouldered Troupial, which is considerably more like a true Starling.

This bird is not rare, but only appears in the market spasmodically, when it can sometimes be purchased for a few shillings. Like its allies, it is intolerably wild, even in a fair-sized aviary—indeed, I have found it become tamer in a cage, although the want of free movement undoubtedly shortened its life. I have had two specimens, and, although it is rather a pretty bird and by no means spiteful towards other and weaker associates, I shall never purchase another. It, however, has merits, for it is always in perfect plumage excepting when moulting, never has anything the matter with it, lives for years upon millet and canary alone, and has a comical (if not exactly pleasing) song, which I took down as follows:—"*Twink twink, tetti, tetti cherrrr. Chee, chee, cherrrr. Cheow-cheow, chee, chee, cherrrr.*" The song thus has three breaks, each ending in the same rattling note—something like a clock-spring giving way suddenly. A variation of the song runs "*Ching-*

ching, chee-chee, urrrr," repeated at intervals of two or three minutes. In both utterances the first two notes are somewhat metallic.

RED-HEADED MEADOW-STARLING (*Agelæus ruficapillus*).

Male similar to *A. frontalis*, but blue-black; the chestnut on head and throat browner, more restricted on the latter. Female said to resemble the male, but sure to have a weaker bill. Hab., Argentina and Paraguay.

Hudson ("Argentine Ornithology," Vol. I., pp. 99, 100) observes:—"The beauty of the bird and its delicate, plaintive voice would no doubt make it a favourite with man if he saw more of it, only it lives and breeds in marshes, and does not come near his habitations. The Red-heads are gregarious and migratory. The flock can scarcely be said to break up in the breeding season, as the birds all make their nests near together in the reeds. The nest is placed about one or two feet above the water, is about six inches in depth, and made of leaves and aquatic grasses woven together. The eggs are four, pointed, with a white or pale bluish ground, and spotted with black at the larger end.

"The song of the Red-head is quite unique in character. It begins with a low, hollow-sounding note, then the voice changes to a clear, sorrowful tone, rising in a rapid succession of short notes, and falling again in longer ones.

"After the breeding season the birds fly about in flocks of two or three hundred individuals, and sing in concert on the trees.

"Their chirp has a peculiar metallic sound, and can be imitated by tapping on the edge of a copper bell with the finger-nail."

Graham Kerr (*The Ibis*, 1892, p. 127) says:—"Occasionally met with in flocks feeding amongst the tall grass, etc., by the edges of marshes."

It is tolerably certain that dealers have confounded this species with the preceding; it must have come in mixed consignments from La Plata. It has been exhibited at the London Zoological Gardens.

YELLOW MEADOW-STARLING (*Agelæus flavus*).

Black above; head, bend of wing, rump, and under surface bright yellow; bill and feet black. Female above brown, slightly streaked; eyebrow-stripe, rump, and under surface yellowish; bill and feet brown; bill shorter than in male. Hab., Paraguay, Uruguay, and Argentina.

Hudson says ("Argentine Ornithology," Vol. I., pp. 98, 99): "The dull-plumaged birds are always very much more numerous than the bright-coloured males, though Azara strangely asserts that the sexes are alike. In Buenos Ayres, where it is called "Naranjo" by the country people, in allusion to its orange tints, it is very well known on account of its yellow plumage, which looks so wonderfully brilliant in the sunshine, and its partiality for cultivated districts, where it follows the plough to pick up worms, and frequents the orchard to sing, associating with the common Cowbird and Yellow-breast. It remains all the year, and is very sociable, going in flocks of from twenty to fifty individuals, which, when they settle on the trees, all sing in concert, pouring out their few peculiar notes with great power and emphasis.

"Even in the breeding season these companies do not always break up, and frequently several pairs have nests near together. The nest is usually built in a cardoon thistle, two or three feet above the ground, and is made of dry grass. The eggs are four, pointed, white or with a bluish tinge, and speckled irregularly with deep brown, the spots being closer and sometimes confluent at the broad end."

This bird first arrived at the London Zoological Gardens in 1873, and Russ tells us that E. von Schlechtendal became possessed of specimens in 1876, and states that both males and females industriously and joyfully repeated their *dsitt, dsitt, dszrrrrih*. Prince Ferdinand of Bulgaria acquired it in 1878, and Russ himself received a male from Miss Hagenbeck and two females from Messrs. Fockelmann in 1892. He considered them innocent birds, but very greedy for mealworms and all kinds of insects, snatching them away from before the very bills of other birds, and especially of the Bulbuls.

YELLOW-SHOULDERED MARSH-TROUPIAL (*Agelasticus thilius*).

The adult male is blue-black, with the lesser wing-coverts bright daffodil yellow, the bill and feet black, the iris brown; the female and young male are brown streaked with black, the eyebrow white, beneath ashy white streaked with black; the female is smaller and has a shorter bill than the male. Hab., S. Peru, Chili, Paraguay, and Argentina.

The Yellow-shouldered Troupial is gregarious, being seen in flocks throughout the year; and it feeds upon the ground, upon insects and seeds of weeds.

The nest is neatly made of dry grass, and is attached to rushes growing in the water. The eggs are white, spotted at the larger end with dull brown and black; they are four in number and pointed at the small end.

The song is curiously like the sound made by an old iron pump—*Chinker-on-king-tschwee*—the last note representing the rush of water; but Hudson (who seems to hear melody in the most ludicrous performances) says that, though limited in its range, it is very sweet, some of the notes being remarkable for their purity and expression. They are undoubtedly "remarkable for their expression" and for the expression which they produce upon the faces of those who listen to them; but, as for the purity, if a Corn Bunting's *zweezh* is pure, then this Troupial's *tschwee* (which is probably a foreign version of the same note) is entrancing. Like its allies, it is imported from time to time in small batches, and (not being a general favourite) is usually obtainable at a moderate cost.

I purchased a supposed pair of this bird in 1894, but subsequently discovered that I had secured adult and young males; one of these birds I exhibited later on at the Crystal Palace. I found them very cunning, dashing for the door when I renewed their food. They walk and look like true Starlings, open their bills wide in the seed pan, scattering the grains far and wide, and (unlike the Military Troupials) they roost on a perch at night. They require plenty of insects, soft food and fruit may be given if they will eat it. I did not find this a long-lived species, but I never tried it in an aviary. It ought to be easily captured in abundance, yet it is not always cheap in the market, though I paid no excessive price for my specimens. It is a more graceful-looking bird than the more typical Meadow-Starlings of the genus *Agelæus*, and its more slender bill gives it a greater resemblance to the Starlings of the Old World.

FLAME-SHOULDERED MARSH-TROUPIAL (*Agelasticus humeralis*).

Male glossy-black; wing-coverts ruddy yellowish-brown, with a paler edging below; back of thighs partly yellow. Female rather smaller and more slen-

der; the outer wing-coverts mixed with black. Hab., Cuba. Gundlach says that this bird is "common, and lives less in the forests than at the borders of the woods, and other places where there are trees. In the autumn they unite into communities, which at that time make havoc of the millet and rice fields. Later in the winter they seek their food in the plantations, feeding in the pig-sties or the drying trays used for sugar. Also they search for nectar in the larger flowers of trees. In the afternoon they assemble in considerable numbers on lofty trees or bamboo cane to rest, and there each of these birds from time to time exercises his monotonous voice, so that from the multitude of their cries, a great but not unpleasing sound arises. At the least alarm they are instantly silent, but so soon as this is comprehended, they again commence their noise. Occasionally they are combined with other species of the family, and then the concert produced by all together is even more complete.

"This Starling nests in April and May, constructing its nest on slenderly branched sites on the trees, or on the leaf-sheaths of palms, or between the large leaves of the *Bromelias* living as parasites on the trees, of dry plants, hair, feathers, etc. The laying consists of four eggs."

Thienemann describes the eggs as somewhat elongated, not symmetrical, grey-greenish-white, sparsely dotted with grey and black-brownish points, which are wanting at the apex, but numerous at the base, which is covered by a large brown patch and small black-brown dots. Length 22 mm., breadth 14 mm. Freiherr von Grote bred the species in 1838; and I believe a pair belonging to Mr. G. Millsum nested unsuccessfully much more recently: the eggs were four in number, pale bluish-green, with dark spots on the larger end; incubation lasted thirteen days; three young were hatched, but not reared.

In June, 1900, Mr. Praschkauer, of the well-known firm of bird-food importers, asked me if I would be willing to accept a rare Oriole which, for ten years, had been his wife's pet; she was in constant anxiety lest it should fall a victim to some prowling cat, and therefore was willing to give it up. Of course, I accepted with pleasure. While in her possession it had been fed upon sponge-cake and fruit; but being kept in a rather small cage had almost lost the power of flight. It, however, soon learned to use its wings again in a good-sized flight-cage. I fed it exactly in the same manner as my Tanagers. Whenever it is fed, or if you speak to it, this bird utters a harsh note—*waa* (with a peevish *ware* sound in it, only more sharp, as if the *r* were omitted); sometimes it is more like *chare*. This appears to be the call-note, and is described by Mr. Page as "a caw, somewhat similar to that of a Rook, but pitched in a different key, and a little more mellow." He, however, says:—"Power of song he has none," in which, if his bird and mine are of the same species (and I know of no other with the coverts ruddy yellowish-brown), I differ from him entirely. My bird certainly has the best song, though not certainly the purest in sound, of any Starling that I have heard sing, and it will often sing to order. The performance is very similar to that of a domesticated Canary, if you can fancy the song produced by a Starling, all the notes harsher, less penetrating, but quite pleasing.

This bird is never ill, and bids fair to live for many years yet. It was probably at least a year old when originally purchased, was ten years in the purchaser's possession before she gave it to me, and is quite sprightly as I write in 1908.

Mr. Page secured his supposed pair (the hen was probably that sex of *Agelæus frontalis*, which I have had offered to me once and seen several times) early in 1906, when there were others in the market; he published an account of it in "Bird Notes" for that year, pp. 203-206. The fact that his cock bird showed off to its companion is not surprising, as mine also used to show off to a cock Hang-nest in a cage close by. Mr. Underwood, the traveller, recognised my bird as a "Fire-shouldered Troupial," and Russ calls *A. humeralis* "The Hang-nest with fire-red wing-coverts."

Dark Green Maize-eater (*Pseudoleistes virescens*).

Deep olive-brown; lesser upper wing-coverts, under wing-coverts, and middle of abdomen yellow; bill black; feet dark brown. Female rather paler and more olivaceous; bill longer and more tapering than in the male. Hab., South Brazil, Paraguay, Uruguay, and Argentina.

Hudson says of this bird ("Argentine Ornithology," Vol. I., pp. 102, 103):—"It is active, strong on the wing, sociable and noisy; and being, moreover, a pretty and elegant bird, very common in settled districts, and with a preference for man's neighbourhood, it is familiar to everyone, and has won among many competitors the vernacular name of *Pecho-amarillo* (Yellow-breast), for with us yellow-breasted species are somewhat numerous. It remains all the year, invariably going about in flocks of from twenty to thirty birds, and feeds on the ground in the fields or on the open plain. While they are feeding, one bird takes up a position on a stalk or thistle-top to keep guard; when he flies down another bird takes his place; if a person approaches, the sentinel gives the alarm, and all the birds fly off in a very close flock, making the air resound with their loud ringing notes. After feeding, they repair to the trees, where they join their robust voices in a spirited concert, without any set form or melody such as other songsters possess, but all together, flinging out their notes at random, as if mad with joy. In this delightful hubbub there are some soft, silvery sounds. Where they are never persecuted they have little fear of man, but they invariably greet his approach with a loud, vigorous remonstrance.

"In October the birds break up their companies to pair. Sometimes they breed on the open plain in a large cardoon thistle, but a thick bush or low tree is preferred. The nest is like that of a Thrush, being deep, compactly made of dry grass and slender sticks, plastered inside with mud, and lined with hair or soft, dry grass. It is, however, deeper and more symmetrical than the Thrush's nest, and it is sometimes plastered with cow-dung instead of with mud. The eggs are four, very long, white, and abundantly spotted with deep red, the spots becoming confluent at the large end.

"The Yellow-breast is never seen to quarrel with its fellows or with other birds, and it is possibly due to its peaceful disposition that it is more victimised by the parasitical *Molothrus* than any other bird. I have frequently found their nests full of parasitical eggs, as many as fourteen, and in one case sixteen, eggs in one nest. In some seasons all the nests I found and watched were eventually abandoned by the birds on account of the number of parasitical eggs dropped in them. I have also so frequently found parasitical eggs on the ground under the nest that I believe the Yellow-breast throws out some of these foreign eggs, and in one instance I was quite sure that this had happened. The nest was in a cardoon bush, and contained five eggs—two of the Yellow-breast and three parasitical. These three were of the variety most thickly mottled with red, and consequently close resembling the eggs of the

Yellow-breast. I was surprised to find five more eggs of the Cow-bird on the ground, close together, and about three feet from the bush; and these five eggs were all pure white and unspotted. Naturally I asked, How came these eggs in such a position? They had not fallen from the nest, which was very deep, contained few eggs, and was scarcely thirty inches above the ground. Then they were all white, while those in the nest were mottled. That the eggs had been laid in the nest I felt certain; and the only way I can account for their being in the place where I found them is that the Yellow-breast itself removed them, taking them up in its bill, and flying with them to the ground."

This species appears to have been first imported into Germany by Gudera, who received a single specimen in 1875 and a second in 1876. The London Zoological Gardens first secured it in 1877; Charles Jamrach first imported it in 1879, and in 1882 it first reached the Amsterdam Gardens.

Why so common a bird, and one which could be easily obtained, so rarely appears in the European bird-markets it would be hard to say, unless its very abundance makes the Argentine catchers consider it not worth the trouble of trapping.

Green or Yellow-bellied Maize-eater (*Pseudoleistes guirahuro*).

Deep olive-brown; the lesser upper wing-coverts, lower back, abdomen and under tail and wing-coverts bright yellow; bill black; feet dark brown. Female said to be similar, but it probably differs as in the preceding species, as Burmeister indeed states. Hab., South Brazil, Paraguay, and Corrientes.

"To be met with in the interior of Brazil, by ponds and lakes, in the reeds, in small companies here and there and pretty generally; the birds are watchful and cautious, usually quiet until one gives a sign, whereupon the whole simultaneously burst out shrieking and fly off." "The very spherical bluish-white red-spotted egg is figured by D'Orbigny." (Burmeister, "Systematische Uebersicht," III., p. 265.)

This species was first represented in the Amsterdam Zoological Gardens in 1866, and in 1886 was imported by Ruhe, of Alfeld, and was claimed by Messrs. Darviot, of Beaune.

Common Cow-bird (*Molothrus pecoris*).

Male black shot with purplish-blue; the head and body below as far as the middle of the breast smoky or pale chocolate brown; remainder of under surface black shot with green; bill and feet black. Female smaller; brown, mottled with black; paler and with darker shaft-spots on under surface; throat ashy whitish; bill smaller and narrower. Hab., North America, southward through Mexico to Vera Cruz and Oaxaca.

J. G. Cooper ("Ornithology of California," pp. 258, 259) observes:—"The remarkable habit of this bird of laying its eggs in the nests of other birds, instead of building for itself, relieves it from the usual necessity of pairing in the spring, and it remains gregarious at all seasons, though generally the flocks are not large, except in autumn. They seemed to be migrating northward through the Colorado Valley early in April, and on the 19th of that month I found an egg of this bird in a nest of the Yellowbreasted Chat (*Icteria*), showing that some of them are raised in the lat. of 35 deg., as well as northward.

"According to Nuttall, the sexes are polygamous, not even pairing like other small birds for one year. In the East he found their eggs oftenest in the nests of the *Vireo olivaceus, Geothlypis trichas, Spizella socialis, Dendræca æstiva, Polioptila cærulea*, and other species corresponding to our *Vireo Huttoni, Sialia mexicana, Cyanospiza amœna, Melospiza Heermanni, Sayornis nigricans*, and *Turdus nanus*, all of which may be supposed to act as nurses for this foundling bird in California. Though all much smaller than the Cow-bird, and building in very different situations, the foster-parents usually take good care of the large egg found in their nest, especially if laid after one of their own, and frequently begin to sit immediately, although their own number is not complete. The *Vireo* even sometimes deserts the nest if the egg of the Cow bird is taken. The *Dendræca*, however, is not so easily deceived, as it sometimes builds a new floor or entire nest over the strange egg, burying it completely. Larger birds have been known to throw the egg out, but small ones are unable to do this. The *Icteria*, whose own egg is nearly as large, and quite differently coloured, seemed, in the instance I saw, a willing dupe, though probably quite able to eject the parasite.

"The colour of the Cow-bird's egg is nearly pure white, thickly sprinkled with points and blotches of olive-brown, of two shades, most numerous near the large end. Sometimes the egg is nearly pure white, with very dark spots. It is small for the size of the bird, obtuse, measuring about 0.71 × 0.56 inch, and is supposed to be hatched in about twelve days, developing sooner than the smaller eggs, perhaps because it obtains more warmth by contact with the body of the bird. When the legitimate eggs are hatched, the young are soon stifled by the larger and stronger foundling, which gets most of the food brought by the old birds, and fills up the small nest in a few days. The parents then carry off their own dead offspring, and drop them at a distance, while the foundling, receiving their whole attention, grows rapidly, and after becoming fully fledged deserts its deluded foster-parents for the society of its own species.

"The name of Cow-bird is derived from the partiality of this species for the society of cattle and horses. In the districts they inhabit they may almost always be found among herds of cattle, walking after them to pick up the insects distributed by their feet, and often alighting on their backs and heads. They also associate with their relatives, the other Blackbirds, especially in fall and winter.

"The males, especially in spring, utter a few guttural croaking notes, either from the top of a tree, or occasionally on the ground, sounding as if they tried to imitate the more musical Redwings. They are at all times watchful and suspicious, and the female, when desirous of laying, shows much artfulness in searching for a suitable nest through the thickets, watching until the owner is absent, and then taking the opportunity to deposit her egg. Two eggs have been found in one nest, but Nuttall thinks that in these cases one is always abortive."

Russ says that at times this Cow-bird is quite common in the German bird market, but doubtless this state of things is now at an end. He says that he made several attempts to breed the species by turning them loose with many birds that were nesting, but they laid no eggs; he says that Messrs. Linden and Wiener made similar attempts with like results. It has been exhibited in the London Zoological Society's collection.

The Greater Cow-bird (*Molothrus æneus*).

Black glossed with golden green; wings and tail purplish; bill and feet black. Female smaller, blackish slightly glossed on the back and strongly on wings and

tail with purplish. Hab., Mexico, Yucatan, Guatemala and southward to Veragua.

Dr. Frantzius says: "This beautiful bird occurs in companies, especially at the commencement of the dry season in Costa Rica, and disappears as soon as the rainy season commences; at the same time it may often be met with even in the middle of the rainy season if, owing to continuous north-east wind, dry weather prevails for some weeks. I have discovered nothing respecting its nidification. In Costa Rica one notices these birds perching in thickly foliaged trees, where they chatter together after the manner of Starlings, or they sit in long rows on the ridges of roofs. They find plenty of food in the market-place, where they busily pick up the fallen grains of maize and rice, and then show very little nervousness." (Russ, "Fremdländischen Stubenvögel," II., p. 569.)

It is possible that this may be the species of which Mr. Beebe writes ("Two Bird-lovers in Mexico," p. 117): "Cow-birds with red eyes chased grasshoppers and other insects."

Boucard ("Proceedings of the Zoological Society," 1883, pp. 445, 446) observes: "This bird is very abundant in all parts of Yucatan. It lives in flocks, and generally frequents barn-yards and cow-pens. I have frequently seen it perched upon the back of a horse or cow, in order to pick maggots out of old sores. These sores are very prevalent among draught horses in Yucatan, and wherever there is a sore the flies soon populate it with their larvæ; the sore then spreads, and hundreds of maggots may be extracted from a single sore. In the intolerable laziness and neglect of these people to attend to wounded animals, it seems as if God had sent this bird as a merciful surgeon to clean the foul ulcers of poor helpless brutes."

Russ spoke of this as one of the rarest birds in the European trade, and one which, so far as he knew, had only been once seen at the Berlin Zoological Gardens; but, coming from Mexico and Central America, it is far more likely to be imported now than North American species.

Argentine or Silky Cow-bird (*Molothrus bonariensis*).

Uniform shining purplish blue-black; less lustrous on wings and tail; bill and feet black; irides brown; length 7½in. Female slightly smaller, deep ashy or mouse-brown, mottled with black; paler below; bill smaller and narrower than in male. Hab., Argentina, Patagonia, Paraguay, Uruguay, Bolivia, and Brazil.

Hudson devotes nearly fourteen pages to an account of the habits of this species, but it seems to have much in common with other Cow-birds; I quote the following from p. 73 of his "Argentine Ornithology": "They feed on the ground, where in their movements and in the habit the male has of craning out its neck when disturbed they resemble Starlings. The male has also a curious habit of carrying his tail raised vertically while feeding. They follow the domestic cattle about the pastures, and frequently a dozen or more birds may be seen perched along the back of a cow or horse. When the animal is grazing they group themselves close to its mouth, like chickens round a hen when she scratches up the ground, eager to snatch up the small insects exposed where the grass is cropped close. In spring they also follow the plough to pick up worms and grubs.

"The song of the male, particularly when making love, is accompanied with gestures and actions somewhat like those of the domestic pigeon. He swells himself out, beating the ground with his wings, and uttering a series of deep internal notes, followed by others loud and clear; and occasionally, when uttering them, he suddenly takes wing and flies directly away from the female to a distance of fifty yards, and performs a wide circuit about her in the air, singing all the time. The homely object of his short-lived passion always appears indifferent to this curious and pretty performance; yet she must be even more impressionable than most female birds, since she continues scattering about her parasitical and often wasted eggs during four months in every year. The language consists of a long note with a spluttering sound, to express alarm or curiosity, and she occasionally chatters in a low tone, as if trying to sing. In the evening when the birds congregate on the trees to roost they often continue singing in concert until it is quite dark; and when disturbed at night the males frequently utter their song while taking flight, reminding one of the *Icterus pyrrhopterus*, which has only its usual melody to express fear and other painful emotions. On rainy days, when they are driven to the shelter of trees, they will often sing together for hours without intermission, the blending of innumerable voices producing a rushing sound as of a high wind. At the end of summer they congregate in flocks of tens of thousands, so that the ground where they are feeding seems carpeted with black, and the trees when they alight appear to have a black foliage."

Respecting the eggs, Mr. Hudson says (pp. 78, 79): "There is an extraordinary diversity in the colour, form, and disposition of markings, etc., of the eggs of *M. bonariensis*; and I doubt whether any other species exists laying eggs so varied. About half the eggs one finds, or nearly half, are pure unspotted white, like the eggs of birds that breed in dark holes. Others are sparsely sprinkled with such exceedingly minute specks of pale pink or grey as to appear quite spotless until closely examined. After the pure white, the most common variety is an egg with a white ground, densely and uniformly spotted or blotched with red. Another not uncommon variety has a very pale flesh-coloured ground, uniformly marked with fine characters, that look as if inscribed on the shell with a pen. A much rarer variety has a pure white shell with a few large or variously-sized chocolate spots. Perhaps the rarest variety is an egg entirely of a fine deep red; but between this lovely marbled egg and the white one with almost imperceptible specks there are varieties without number; for there is no such thing as characteristic markings in the egg of this species, although, as I have said before, the eggs of the same individual show a family resemblance."

Russ says that this is one of the commonest birds in the German market, and generally finds purchasers on account of its cheap price.

The Silky Cow-bird is not a pleasant aviary pet, for although not aggressive, extremely easy to keep, and very long-lived, it never becomes tame, but, after years of association with its owner, remains as wild and nervous, if he approaches the aviary, as when first turned out; even in a cage it can never be called a confiding bird. I must confess that I was thankful when my friend, Mr. Pool, took a fancy to my pair and chose them as part of an exchange. I hope he never repented. Mr. Page did not hold my opinion of the species, as he seems to have possessed a pair which became tolerably confiding. I had previously had a slightly larger male from Brazil, but it was just as wild and nervous as the Argentine birds.

I am satisfied, from the fact that I have kept this species for years in perfect health and plumage upon seed alone, that Cow-birds pick up quite as many seeds of weeds as they do insects and grubs.

Neither of the males which I kept ever uttered a note

beyond a low grunting sound as an apology for a song, but there is no doubt that some examples are somewhat more musical.

Purple Cow-bird (*Molothrus purpurascens*).

Male nearly resembling the preceding species, but with rather stronger bill and feet. Female pale dust-brown with dusky mottling; browner above and paler below than that sex of *M. bonariensis*. Hab., Lima (Peru).

This is probably only a local race of the Silky Cow-bird; it is, however, apparently less numerous, as Taczanowski speaks of it as usually forming small companies in which the number of females and young greatly exceeds that of the males. These birds, like their relatives, accompany troops of cattle and horses, especially the latter. He describes the song as very varied and pleasing. This species has been exhibited at the London Zoological Gardens.

Glossy Cow-bird (*Molothrus atronitans*).

Male very similar to *M. bonariensis*, but more shot with violet blue, and with more metallic-green gloss on wings and tail; it appears to be a trifle smaller. Female dark brown, with a faint purplish tinge; below paler. Hab. : Guiana, Venezuela, and Trinidad.

Another local form of the Silky Cow-bird, which I am satisfied has been offered to me on at least one occasion. Russ says that Miss Hagenbeck received it, and also C. Reiche.

Bay Cow-bird (*Molothrus badius*).

Brownish ashy; wings chestnut or cinnamon; the tips of primaries, inner portions of secondaries, and the tail blackish; under surface rather paler; bill black, feet black; irides brown. Female slightly smaller and duller. Hab : Argentina, Paraguay, and Bolivia. Hudson ("Argentine Ornithology," pp. 96, 97) says : "The bay-wings usually go in small flocks, numbering from ten to thirty individuals, and are not migratory, but in winter they travel about a great deal from place to place without extending their journeys more than a few miles in any direction. They are fond of coming about houses, and are frequently seen pecking at the fresh meat hanging out of doors; and, like other birds of the same tribe, feed chiefly on the ground. They spend a great portion of their time on trees, are familiar with man, and inactive, and in their motions singularly slow and deliberate. Their language is varied. Curiosity or alarm is expressed by trilling notes, and before quitting a tree all the birds of a flock ceremoniously invite each other to fly, with long clear notes, powerful enough to be heard a quarter of a mile away.

"They also sing a great deal in all seasons, the song being composed of soft, clear, rather sweet notes, variously modulated, uttered in a leisurely manner, and seeming to express a composed frame of mind, all the birds in a flock singing in concert. During the cold season the flock always finds some sheltered sunny spot on the north side of a wood-pile or hedge, where they spend several hours every day, sitting still and singing in their usual quiet, soft, style.

"Their extreme sociability affects their breeding habits, for sometimes the flock does not break up in spring, and several females lay in one nest together; but whether the birds are paired or practice a promiscuous intercourse I have not been able to discover. They have a great partiality for the large domed nests made by the *Anumbius acuticaudatus*, called Leñatero in the vernacular. One summer a flock of about ten Bay-wings took possession of a Leñatero's nest on one of my trees, and after a few days I took fourteen eggs from it. Though the birds hopped, chirping round me, manifesting great solicitude, the eggs were quite cold, and had I left them many more would have been laid, no doubt; but as they were piled up three or four deep in the nest they could never have been hatched.

"As a rule, however, the flock breaks up into pairs; and then a neat, well-made nest is built in the fork of a branch, lined with horsehair; or, oftener still, a Leñatero's nest is seized, the Bay-wings fighting with great spirit to get possession, and in it, or on it, their own nest is made. Like their relation, the Common Cow-bird, they seem strongly attracted by domed nests, and yet shrink from laying in the dark interior; as a rule, when they have captured a Leñatero's nest, they break a hole in the side, and so admit the light, and form an easy entrance. One summer a pair of Bay-wings attacked a Leñatero's nest on one of my trees; the fighting was kept up for three or four days, and then at the foot of the tree I found five young Leñateros, fully fledged, which had been pecked to death and thrown out of the nest.

"The eggs of the Bay-wing are five in number, nearly round, and densely marked with dusky reddish brown.

"Once I observed two young Bay-wings following a Yellow-breast (*Pseudoleistes virescens*) with their usual peculiar hunger-cry, and while I watched them they were fed several times by their foster-parents. Naturally, I concluded that the Bay-winged Cow-bird is sometimes parasitical on other species, but I never saw anything afterwards to confirm me in this belief, and I believe now that I was mistaken, and that the young Bay-wings were not *real* Bay-wings, but the young of *Molothrus rufoaxillaris*."

Dr. Russ does not seem to have thought much of the song of this bird; he calls it "more wonderful than agreeable"; and Alexander von Homeyer says that "the powerful strophe sounds admirably like something between the confused chirping of many small birds and the shrieking song of New Holland Parrots." Dr. Russ tried to breed the species, but failed. He speaks of it as one of the birds which arrives regularly in the market; but I cannot say that I have ever seen it in any English bird-shop, possibly for the very reasons which Russ gives for its general rejection by the initiated, who are aware of its malicious disposition towards other birds and anything but melodious song,* for which reasons, he says, we hardly ever see it excepting in zoological gardens. It first reached those of Amsterdam in 1838, and those of London in 1860.

Chilian Marsh-Troupial (*Curæus aterrimus*).

Sooty black, sometimes with slight greenish reflections and paler shaft-stripes on upper surface; feathers of head lanceolate and somewhat rigid; bill and feet black; irides dark brown. Female not differentiated, but with a greyish indigo gloss, and with shorter and less tapering bill. Hab. : Chili and Western Patagonia to the Magellan Straits.

In his handsome work on the "Birds of Tierra del Fuego," pp. 56, 57, Captain Crawshay says : "The Black Starling is a common bird in the scrub-covered, well-watered slopes of the Sierra Carmen Sylva, also in similar country elsewhere. It is resident the entire

* His actual words, spoken satirically, are "its nothing less than melodious song"; his later statements show that he was not in earnest.

year. I was surprised to find some British settlers eating it in the belief that it is a 'Blackbird'—as, of course, it is, in colour at any rate. Usually it is met with in companies of half a dozen or more. It perches freely on bushes, and is a vociferous songster. If one of a company takes wing, all follow; and again congregate closely, singing vigorously. They have a habit of coming to one from a distance, and sometimes follow one in this way again and again. This is nothing more than friendly curiosity; for they alight quite close in the most confiding manner, and at once burst out into song—one bird leading off and all joining in.

"On one occasion, I remember sitting down amongst scattered bushes in a steep grassy valley to get my hand camera into position to take a picture; and, as I was waiting for the light to improve, a flock came and perched quite close all round me—some on bushes, some on the ground—and remained while I was there, singing lustily.

"Principally this Starling seeks its subsistence in moist, spongy ground. Larvæ and mature insects are its food."

Mr. Ambrose A. Lane (*The Ibis*, 1897, pp. 27, 28) gives a more complete account of the species: "This species is abundant throughout central and southern Chili, and is generally known as the 'Tordo' (Thrush).

"The sexes are similar in colour, and differ little in size. These birds prefer agricultural districts, and in winter time are usually seen in flocks. They feed chiefly, if not altogether, on the ground, eating insects, grain, and fruit, and are very rapacious. I had one alive for some time in an outhouse in Rio Bueno; it was much like a specimen of the Corvidæ, being rather familiar and cunning; it did not appear afraid of other birds, and could defend itself ably with its powerful bill and claws. The rats did not take it, although I believe only for its strength and pluck they would have done so, as it had been winged slightly, and could fly little in consequence. However, one day it got out and made good its escape into some dense covert in spite of determined pursuit.

"They nest in thick shrubs or bushes about 6 to 8 feet from the ground. I found only one clutch of eggs, which were broken. The average number is four or five; they are of a light bluish ground, with a few black patches or specks.

"Of the three Chilian Icteridæ, this is the most vivacious and familiar, as it is more frequent around dwellings. It is extremely voluble, having some notes not unlike those of our Starling, and a somewhat similar method of singing. In this respect, however, these birds almost excel the latter, and their performance is pleasing and frequently heard. In Arauco they commenced singing early in August. They have some pretty notes, and individuals develop capital variations in their song, as they have considerable ability in mimicking the notes of other birds. I once heard one imitate exactly the call-notes of *Colaptes pitius*. They are very sociable among themselves, and keep up a good deal of chattering and chuckling when together.

"In winter I have watched a flock on ploughed land grubbing busily in the clay for worms, etc.

"They are frequently kept in cages in the central provinces."

If Mr. Lane had only described the character of the nest this account would have been all that could be desired. Dr. Russ publishes no field-notes respecting the species. Two examples were in the London Zoological Gardens in 1856, and two arrived in 1871. In 1891 the dealer Fockelmann imported two more.

Red-headed Marsh-Troupial (*Amblyrhamphus holosericeus*).

Black; the entire head, neck and upper breast and thighs scarlet or orange-vermilion; bill and feet black. Female not differentiated in scientific works; she has a smaller and more slender bill than the male. Hab.: Paraguay, Argentina, and Uruguay.

Hudson says ("Argentine Ornithology," Vol. I., pp. 101, 102): "Azara named this species *Tordo negro cabeza roxa;* it is also called *Boyero* (ox-herd) by country people, from its note resembling the long whistle of a drover; and sometimes *Chisel-bill*, from the peculiar conformation of the beak, which is long, straight, and has a broad, fine point, like a chisel."

"These birds are lively, active, and sociable, going in flocks of from half a dozen to thirty individuals; they remain all the year, and inhabit the marshes, from which they seldom wander very far, but seek their insect food in the soft decaying rushes. They are common on the swampy shores of the Plata, and when seen at a distance, perched in their usual manner on the summits of the tall rushes, their flame-coloured heads shine with a strange glory above the sere, sombre vegetation of the marshes. The long whistling note above mentioned is their only song, but it varies considerably, and often sounds as mellow and sweet as the whistle of the European Blackbird.

"The nest is an ingenious structure of dry grasses, fastened to the upright stems of an aquatic plant, 3 or 4 feet above the water. The eggs are four, in size and form like those of the English Song-Thrush, spotted somewhat sparsely with black on a light-blue ground.

"The young birds are entirely black at first, and afterwards assume on the head and neck a pale terra-cotta red, which gradually deepens to vivid scarlet."

Russ says: "With us this Starling is not so rare in the trade; but we usually find it only in zoological gardens. It was also present in the collections of E. von Schlechtendal and A. F. Wiener, but, unhappily, very trivial observations were made. The latter possessed a pair in 1875; he stated that in July, 1876, a pair in the London Zoological Gardens built a nest in a hollow branch, but laid no eggs. With me these birds developed great delight in chipping away the bark of trees, and as a short time ago I saw one of these birds at a dealer's, the bill of which, in the course of six months, had become entirely distorted, I should advise all aviculturists to give them plenty of gravel, and twigs with the bark on, whereby the bill may receive the proper amount of work. My Marsh-Starlings ate soft fruit and mealworms with pleasure. In England this bird appears occasionally at bird shows, and, considering its beauty, it is a wonder that we do not see more of it than we do."

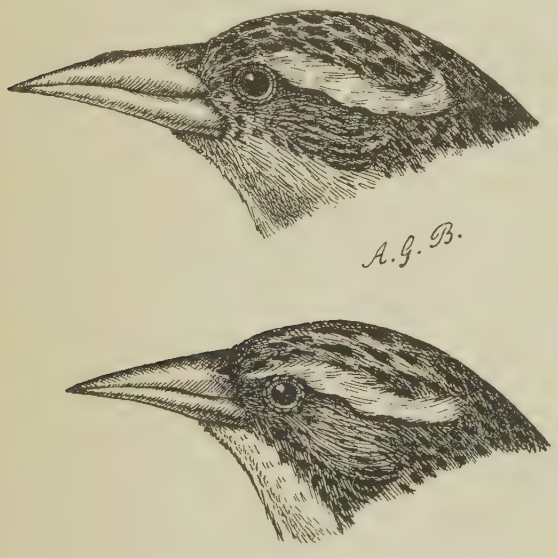
Typical Troupials (*Sturnellinæ*).

Louisianian Troupial (*Sturnella magna*).

Above brown, streaked with black and buffish; head blackish, with a pale buff or buffy-white median streak; eyebrow-stripe yellow in front, buffy-white behind; bend of wing yellow; lesser coverts broadly edged with grey; rump and upper tail-coverts more buff in tint than the back, broadly streaked with black; both flights and tail-feathers more or less barred; central tail-feathers black in the middle, greyish at the sides, as also are those next to them; the three outermost largely white, the outermost and sometimes the next pair almost wholly white; under-surface bright yellow; chin whitish; a broad crescentic black patch on chest, joining a black spot behind the cheeks; sides of breast

white, streaked with black; sides of body otherwise similar, but more buffish; anal tuft pale buff; under wing-coverts white; upper mandible black, with paler edges, lower pale greyish-blue; feet flesh-greyish; irides brown. Female much smaller; the crown more streaked at the sides with brown; sides of head and neck more buffish; black patch on chest smaller; yellow of under-parts duller. Hab. : Plains of N. America from Saskatchewan southward to Columbia and Guiana; also Cuba (the *S. hippocrepis* of Wagler).

Professor Ridgway recognises five local forms or sub-species of this bird, differing chiefly in size and slight modifications of plumage: two other forms regarded by Dr. Sclater as sub-species—*S. neglecta* and *S. hippocrepis*—he raises to the rank of species. J. G. Cooper ("Ornithology of California," Vol I., pp. 271, 272) says : "This bird is very abundant, and resident throughout nearly the entire State, though probably leaving the high mountains in winter. I think they



Head of Male and Female Military Troupial.

build in the Colorado Valley, as well as all other districts not quite waterless, including all the islands except one or two.

"In fact, the vast grassy plains and hills of California are the most favourable nurseries of this species that could be imagined. Their abundance and large size force them on the attention of everyone, while their lively, sweet, and varied songs make them general favourites. They sing at all seasons, early and late; from the ground, the tree-top, fence, or flying in the air, and when unmolested become so tame as to make the house-top a favourite perch. Their time in spring seems equally divided between an industrious search for food and musical contests with their neighbours. Even the female has considerable musical power, and cheers her mate by singing while he relieves her in sitting on the eggs. She then also has a harsh, petulant chirp, frequently repeated as if in anger.

"Their flight is usually slow and laborious, partly sailing, and they furnish pretty good game for the sportsman when no other is to be found. Their flesh, though rather dry and insipid, is white and much eaten, especially by foreigners, who consider every bird, however small, a great delicacy.

"Their nest is made in a slight depression under a bunch of grass, and usually more or less arched over by blades bent down. It is quite artfully concealed, and the female, if on it, generally skulks off some distance before flying. The eggs are four or five, measuring 1.15 by 0.85 inch, very obtuse, white, with a few large purplish-brown blotches and dots towards the large end.

"They feed chiefly on insects, grass-seeds, and grain, but do no damage in the fields, while they destroy many noxious insects. They walk rather awkwardly, but quickly, and have great ingenuity in concealing themselves when wounded."

A rarely imported bird, which first reached the London Zoological Gardens in 1864. Russ says : "Its price stands tolerably high with us—15 to 20 marks apiece."

Common Military Troupial (*Trupialis militaris*).

Above brown, streaked, especially on head and back, with black; a broad stripe from above eye to back of crown, red just in front of eye, white behind and edged with black below; throat, middle of neck, breast and front of abdomen scarlet; rest of under-surface black, the feathers at sides of abdomen and at vent edged with brown; bend of wing scarlet; under wing-coverts white; bill horn-colour; feet brown; irides brown. Female much smaller; browner above, with paler edges to the feathers; more sandy and more regularly marked from bill backwards; tail regularly barred with black; throat buff-whitish; sides of neck, front of breast, and ear-coverts ashy, ticked with black; sides and flanks ashy olive-brown, with dusky streaks; scarlet restricted to centre of breast, back of chest, and abdomen; bill shorter, weaker, and less curved than in the male. Hab. : Chili, Patagonia, and Falkland Islands.

Durnford observed that this was a common bird at Chupat. "He took a nest from a tuft of pampas-grass near the river banks at the beginning of November. It is resident, and is seen in small parties of four or five, or in small flocks seldom exceeding twenty or thirty in number. It feeds and lives on the ground, and only occasionally is it seen to perch on a low bush. Its flight is strong, and it flies about a great deal, and usually utters its song when on the wing. The song is continued all the year, and is heard even on the coldest days in winter; the notes are few, and not highly melodious, but are cheerful and vigorous.

"The nest is made of dry grass and rootlets attached to the rushes in moist ground, and placed close to or resting on the surface. The eggs are five, the ground-colour white spotted or blotched with reddish brown."*

Captain Crawshay ("Birds of Tierra del Fuego," p. 58) says :—"The Military Starling is a conspicuous bird, being—as it is—such a departure in colouring in a world where all else is generally so subdued in tone. Scrub-covered hills and valleys and the outskirts of forest are its haunt. The scarlet breast is visible two hundred yards away. The ordinary number seen is a pair, or at most four or five together. It is very much a Starling in its ways, also in its limited song. It runs hither and thither on the ground, nodding and bobbing, feeding for dear life. The flight is powerful, but somewhat heavy. The song—if song it can be called—is extraordinarily laboured. It is usually uttered from a tree-top or bush, especially towards evening.

* I first of all translated this account from Russ, but had to erase it on account of the freeness of his translation.

and may be imitated by inflating the lungs with air and expelling it through pursed-up lips in a long-drawn, expiring whistle, '*W-h-i-i*: y-o-o-o.' It takes some effort on the part of the bird to deliver it; the throat can be seen expanding thirty yards away."

This species is common in the bird market, but turns up in batches spasmodically; it is generally confounded by dealers with the next species—indeed, even the late Mr. Abrahams did not know how they differed until I pointed out to him that the Argentine bird had black under wing-coverts. I have never had typical *T. militaris*, but have seen living specimens in my friend Mr. Housden's collection, at bird-shops and bird-shows.

De Filippi's Military Starling (*Trupialis defilippii*).

Male like that sex of *T. militaris*, but smaller, and with the under wing-coverts black. Female like that sex of *T. militaris*, but showing less scarlet on the under parts. Hab., Argentina and Uruguay.

Hudson says ("Argentine Ornithology," Vol. I., p. 106):—"In size, form, gait, flight, language, and colour the present bird closely resembles the Patagonian Starling, but the crimson on the breast is brighter, and the upper parts are darker. Its nesting habits are also

De Filippi's Military Troupial.
(*Male in winter plumage.*)

like those of the northern bird, the number and colour of the eggs being the same in both species. One trivial difference in habit is that De Filippi's Starling occasionally soars up a few yards into the air when uttering its song. It inhabits the moist grassy pampas in the southern part of the Buenos Ayrean province, and is there abundant and unites in large flocks. At the approach of the cold season there is a general movement northwards of the birds, which does not, however, extend far, as the birds, although strong fliers, travel slowly and in a peculiar manner; it is in this season, when the birds are seen moving in large flocks, that the name of Military Starling strikes one as being peculiarly appropriate They do not journey through the air like other migrants, but move over the ground, when the flock, composed of four or five hundred to a thousand or more individuals, is extended so as to present a very long front, and at intervals the hindmost birds fly over the others and alight just in advance of them; the long front, the precision of their movements, and their scarlet bosoms all turned one way, suggest the idea of a disciplined army on its march.

"They never perch on trees, but frequently alight on the roof of a rancho or other elevation affording a secure footing. They are tame birds and fly reluctantly; when approached they usually crouch down, hiding their crimson bosoms, and reman motionless in order to escape observation. In disposition they are peaceful, and so fond of society that when one becomes separated from his fellows he will unite with herds of another kind, even with Plovers or Tyrant Birds."

I imported a pair of this species from La Plata in July, 1893, and they lived in one of my aviaries for about two years, but never became really tame; so that, in spite of their beauty and the ease with which they could be catered for, their loss did not break my heart. At first I tried them in a cage, but found that they rattled about to the injury of their flight and tail feathers. Either in cage or aviary they spent much of the day roosting on a perch, but always occupied the floor at night. This fact makes me rather doubt the correctness of Mr. Hudson's assertion that this species never perches on trees. It must be remembered that Durnford asserted much the same thing about the Military Starling of Patagonia, and yet Crawshay says that its song is usually uttered from a tree-top or bush, showing that it does perch on trees. The crouching with a tilt forward to hide the scarlet throat and breast, is characteristic both of this bird and its close copy the Red-breasted Marsh Troupial; both, also, rise for a short distance into the air to utter their excruciating songs, which are a medley of whistles and such sounds as can be imitated by screwing round the lid of a circular wooden box. It is strange if the whistle described by Captain Crawshay is the whole song of the Patagonian bird.

Although, like all the Troupials, these birds will eat soft food, if seed is withdrawn from them, they refuse to touch it when their natural diet (of seeds and a few insects) is supplied; during importation my birds were fed upon hemp, but canaryseed should form the staple, a little millet and hemp, and perhaps a few oats being added.

Glossy Black Troupials (*Quiscalinæ*).*

Rich-Black Troupials (*Dives sumichrasti*).

Uniform blue-black, slightly glossy, bill and feet black. Female a little smaller and less glossed with blue; bill a trifle narrower towards the base. Hab., Mexico, and Guatemala.

Mr. A. Boucard observes ("Proceedings of the Zoological Society," 1883, p. 446):—"Native name 'Pich' (pronounced 'peach'). This is the commonest of all Yucatan birds, being very abundant in all the towns, as well as in the forests. I have seen this bird walking about the busiest streets of Merida, apparently without fear, and it often enters houses in 'search of food.'"

Common as this species is, the above is all that I can discover respecting its wild life, and it seems to have only been imported once, a specimen having reached the London Zoological Gardens in 1876.

Changeable Troupial (*Quiscalus versicolor*).

Black, entire head and neck glossed with purplish, remainder of body with variable shades of green, purple, and violet, bill and feet black. Female smaller, browner, only glossed with blue on head, nape and breast; bill shorter and less tapering. Hab., Atlantic slope of North America, from Saskatchewan to Texas.

Professor Ridgway recognises three sub-species of this

* Called "Grackles" in America, but I believe this name is more properly applicable to the large Mynahs of the Old World.

bird, *Q. quiscula*, *Q. aglæus*, and *Q. æneus*. Respecting the habits of *Q. quiscula* (the typical form) Captain Bendire says ("Life Histories of North American Birds," Vol. II., p. 497-499):—"The Purple Grackle, also called the 'Purple Crow Blackbird,' or simply 'Crow Blackbird,' is one of the best-known and most familiar birds of the localities which it inhabits. In the northern parts of its range it is migratory, departing usually in the beginning of October for its winter home in our Southern States, where it congregates in immense flocks in suitable localities, while in the more southern sections it is a resident throughout the year, and breeds wherever found. The birds that migrate usually return to their breeding grounds early in March, and a few even in the latter part of February, when their arrival is readily noticed. Their peculiar, squeaky notes, consisting of a variety of mostly indescribable sounds, such as "dweekh, dweekh, tchäh, tchäh, tchäh, quäk, quäk," or "dœ, dœ," which seem to be uttered with considerable difficulty, and are invariably accompanied by the opening of the wings and tail, may be heard any morning in early spring from the tree-tops in rather open country, in pastures, as well as in city parks.

"At this time of the year small companies, consisting of from twelve to fifteen birds, are usually seen together, roving from place to place and chasing each other about in search of mates. Unfortunately, as in the case of many other species, the Purple Grackle is not looked upon with favour by the average farmer, and they are often shot in large numbers because they help themselves to a little corn when other food is scarce. Considered from an economic point of view, and judged by careful examinations made by the United States Department of Agriculture of a number of stomachs of these birds killed during every month of the year, it is shown that their food consists largely of animal matter, such as grasshoppers, caterpillars, spiders, beetles, cutworms, larvæ of different insects, remains of small mammals, frogs, newts, crawfish, small molluscs, and fish. While it must be admitted that Indian corn, oats, and wheat are also eaten to some extent, much of the vegetable matter found in their stomachs consists of the seeds of noxious weeds, such as the ragweed (*Ambrosia*), smart-weed (*Polygonum*), and others. Fruit is used but sparingly, and consists usually of mulberries, blackberries, and occasionally of cherries. One of the gravest charges against them is the destruction of the young and eggs of smaller birds, especially those of the Robin. Granting that remains of egg-shells are sometimes found in their stomachs, which seems to be the case about once in twenty-five times, it does not fully prove that all of these birds are guilty of such an obnoxious habit, and on the whole it can be safely asserted that the Purple Grackle does far more good than harm, and deserves to be protected, excepting in localities where they winter, and where, from their immense numbers, they may become a serious nuisance.

"They spend much of their time on the ground, being essentially ground feeders; they walk along close to the heels of the farmer while ploughing, picking up beetles, grubs, etc., as they are turned up by the plough, or search the meadows and pastures for worms, grasshoppers, and other insects suitable for food. They are at all times eminently social birds, even during the breeding season; a number of pairs generally nest together, and frequently several nests will be found in one tree."

"In the selection of nesting-sites, thick, bushy, coniferous trees, such as cedars, pines, and firs, seem to be preferred, but many other kinds are likewise used, notably such as are overrun with vines. Where suitable trees are not available, thick bushes, especially such as overhang water, are also made use of, where the nests are occasionally placed scarcely four feet from the ground. Sometimes natural cavities in trees or hollow stubs, as well as the excavations of the larger Woodpeckers, are also used, and along the seashore, where the Fishhawk is common, they often place their nests in the interstices of these bulky structures, notably so on Plum Island, New York."

"The nests are rather loosely constructed and bulky. The materials used vary greatly according to locality; the outer walls are usually composed of coarse grass, weed stalks, eelgrass, or seaweed, sometimes with a foundation of mud, and again without it. The inner cup of the nest is composed of similar but finer materials, and is generally lined with dry grass, among which occasionally a few feathers, bits of paper, strings, and rags may be scattered; in fact, anything suitable and readily obtainable is liable to be utilised. Exteriorly the nests vary from five to eight inches in height, and from seven to nine inches in diameter, according to location. They are ordinarily about three inches deep by four inches wide inside. The nests are placed at various distances from the ground, some as low as three feet, and others at the extreme tops of trees, or on horizontal limbs from twenty to thirty feet up, or occasionally even higher." "Incubation, in which both parents assist, lasts about two weeks, and they are equally solicitous in the defence of their eggs or young; the latter are able to leave the nest in about eighteen days, and sometimes a second brood is raised. They are fed almost entirely on insects while in the nest.

"The number of eggs to a set varies from four to six, very rarely seven, and sets of five are most often found. The shell is strong, fine grained, and slightly glossy."

He then tells us that the ground colour varies from pale greenish white to pale rusty brown, blotched or streaked with irregular lines or dashes of various shades of dark brown, sometimes also with lavender markings, and rarely with the markings so profuse and evenly distributed as to hide the ground tint. He is rather a prolix writer, as will be seen by the foregoing account, which could have been rendered far more concise without loss of information.

In 1872 this Troupial was represented at the Berlin Aquarium, and since 1880 has appeared at the London Zoological Gardens. It was bred by Dr. Julius Wentko in 1884, the female alone building the nest and laying her eggs every two days; the young were born in about sixteen days; they left the nest a month later. Dr. Wentko received the silver medallion at the Ornis Exhibition at Berlin for breeding this species.

Boat-tailed Troupial (*Quiscalus major*).

Blackish shot with green; head and neck purplish; bill and feet black. Female much smaller, smoky brown with slight metallic reflections on upper surface, middle of abdomen dirty white; anal tuft blackish. Hab., coast region of South Atlantic States of North America. (P. L. Sclater.)

Captain Bendire says ("Life Histories," pp. 506-508): "Like the rest of the Grackles, they are gregarious and sociable in their habits, breeding together in colonies in suitable localities, and roving about during the rest of the year in large flocks."

"They spend a good deal of their time on the ground, walking along slowly and sedately while searching for food. It requires quite an effort for one of the birds to rise from the ground, and until fairly started its flight is slow, heavy, and laborious.

"Their food is largely derived from the sea, and consists mainly of small molluscs and crustaceans of different kinds picked up in the salt marshes and mud flats during low tide, and of dead fish, insects, etc., carried in by the tides. They also feed, though to a small extent only, on vegetable matter, such as rice and other grains, and occasionally on fruit.

"In the more northern portions of their range these birds usually arrive about the beginning of March, and are at first very restless, roving about from place to place until the nesting season commences. They are unusually noisy during this time, and their peculiar grating notes can be constantly heard; some of these are very shrill and unpleasant to the ear, but frequently during the mating season a rather indifferent attempt at singing is made. This is somewhat less disagreeable, but impossible to describe on paper.

"Mr. Frank M. Chapman describes a singular note of theirs as resembling the flapping of wings, as of a Coot tripping over the water. He says: 'This sound was very familiar to me, and so excellent is the imitation that for a long time I attributed it to one of the numerous Coots which abound in most places favoured by *Quiscalus major*.'

"Mr. W. E. Grover, of Galveston, Texas, writes: 'One of their common call notes, when sitting at ease in a tree, is a noisy, clucking "clac-clac-clac," frequently followed by a long-drawn whistle like "who-it, who-it." In this vicinity they nest principally in tule reeds growing in fresh-water ponds, and in the thick, matted grass on the edges of salt bayous, some nests being partly in the water at high tide. Some also nest in Cherokee rose-bushes, and occasionally a pair will build in a tree as much as 40ft. from the ground. The nests of birds built in trees are not so deep nor so well made as those in the canes.'

"Nidification appears to be somewhat irregular with this species. In southern Florida some of these birds begin laying during the first week in March, when quite a number have not even begun nest building. The nesting season lasts until June here, and probably two broods are raised regularly. In the northern portions of their range it begins in the latter part of April, and is sometimes protracted until May. The nests are usually strong, bulky structures, measuring on an average about 7in. in height by 8in. in width. The inner cup is about 3in. deep by 4½in. in diameter. They are constructed mainly of coarse grass, sedges, weed stalks, and fibrous roots, cemented and more or less mixed with mud. In some nests no mud is used, and these are consequently not so solid. Some are built principally of Spanish moss, others of eel-grass, the materials used varying in different localities. Cotton, rags, feathers, and seaweeds are also sometimes incorporated into the walls. They are placed on various kinds of trees and bushes, such as oaks, pines, and willows, and at various heights from the ground, ranging from 3ft. to 40ft. up, and again in water-myrtle bushes, cane-brakes, and reeds in swamps, not over 18in. above the water level.

"The number of eggs laid to a set varies from two to five. Sets of three are most common, but in certain localities sets of four are equally so, while those of five are somewhat rare.

"Incubation lasts about fifteen days, and this duty seems to be mostly performed by the female. The male, however, assists in feeding the young, and after they are able to care for themselves the sexes separate in flocks and remain apart until the mating season approaches again.

"The eggs of the Boat-tailed Grackle closely resemble those of the preceding species (the following one here—*Q. macrurus*), both in shape and coloration, excepting that the cloudy purple vinaceous and pale umber tints are generally more evenly distributed over the entire shell, when present, and are not so noticeable at the small end of the egg. In some instances the lines and tracings with which they are marked are also perceptibly finer as well as more profuse, being more like the markings found in the eggs of the Baltimore and Bullock's Oriole. They also average somewhat less in size."

Russ observes: "With us this species only comes into the market extremely rarely."

Long-tailed Troupial (*Quiscalus macrurus*).

Glossy purplish black, becoming greenish on lower back and anal tuft; wings and tail without gloss; bill and feet black. Females much smaller, above blackish brown, with metallic gloss; below paler excepting on anal tuft. Hab., Mexico and Guatemala.

Boucard ("Proceedings of the Zoological Society" 1883, p. 446) says: "Native name 'Sacoa.' This bird is most common here from January to May. I did not see one in July and August, nor in September, and up to the present time, Oct. 15, the bird has not made its appearance. It does not go in flocks; rarely more than five or six are seen at a time: it apparently sings with very great effort. The female is considered by the natives another species, and is called 'Socao,' instead of 'Sacoa.'"

George B. Sennett says ("Notes on the Ornithology of the Lower Rio Grande in Texas, U.S. Geological and Geographical Survey," Vol. IV., 1878, pp. 27, 28): "When I think of this bird it is always with a smile. It is everywhere as abundant on the Rio Grande as is *Passer domesticus*, the English Sparrow, in our northern cities, and equally tame when about habitations. This bird is as much a part of the life of Brownville as the *barrelero* rolling along his cask of water or the mounted beggar going his daily rounds. In the towns and about the ranches he knows no fear; is always noisy, never at rest, and in all places and positions, now making friends with the horses in the barns, or the cattle in the fields, then in some tree pouring forth his notes, which I can liken only to the scrapings of a cornstalk fiddle; now stealing from porch or open window some ribbon for his nest, then following close behind the planter, quick to see the dropping corn. With all his boldness and curiosity the boys of the streets say they cannot trap or catch him in a snare. He will take every bait or grain but the right one; he will put his feet among all sorts of rags but the right ones, and the boys are completely outwitted by a bird. He performs all sorts of antics; the most curious and laughable performance is a common one with him. Two males will take position facing each other on the ground or upon some shed, then together they begin slowly raising their heads and twisting them most comically from side to side, all the time eyeing each other, until their bills not only stand perpendicular to their bodies, but sometimes are thrown over nearly to their backs. After maintaining this awkward position for a time they will gradually bring back their bills to their natural position, and the performance ends. It is a most amusing thing to witness, and seems to be mere fun for the birds, for nothing serious grows out of it."

"When breeding in swamps their nests are frequently placed within 2 feet of the water, and from 4 feet to 30 feet from the ground when in trees." Their nests, according to Captain Bendire ("Life Histories," Vol. II., p. 505), "resemble those of the rest of our eastern Grackles in size, construction, and materials. Some of them are almost entirely composed

of Spanish moss, while others are mainly built of small round stems of creeping plants, which are flexible enough to admit of their being securely woven together. Mud is often used to bind the materials together, and the upper rim of the nest is generally securely fastened to the surrounding branches or reed stalks among which it is placed. Some nests show no traces of mud in their composition, but the materials forming the outer walls appear to have been quite wet when gathered. The lining usually consists of dry grass and fine roots, and when near towns bits of cotton cloth, feathers, paper, etc., are often found mixed among the other materials.

"Nidification usually begins during the latter part of April; it is at its height in the first half of May and and lasts through June. One, and sometimes two, broods are reared in a season. Young birds of various sizes and fresh eggs may frequently be found in the same colony. The earliest record I have of eggs being taken is one by Dr. Merrill, United States Army, at Brownsville, Texas, on April 4th. Both sexes assist in incubation, which lasts about fifteen days, and in the care of the young, for which they show a great deal of solicitude.

"The number of eggs laid to a set is usually three or four. Sets of five are occasionally found, but clutches of this size are rather rare.

"The ground colour is usually pale greenish-blue, and is often more or less clouded over with purple-vinaceous and smoky, pale, umber tints, which are usually heaviest and most pronounced about the smaller end of the egg. The markings consist mainly of coarse, irregularly-shaped lines and tracings of different shades of dark brown, black, and smoky grey, and less defined tints of plumbeous. In rare instances an egg is found which is only faintly marked with a few indistinct lines of lavender-grey about the small end, the rest of the shell being immaculate. They are mostly elongate-ovate in shape; a few are blunt-ovate, while others approach a cylindrical-ovate."

According to Russ, one of the rarest Starlings in the market. E. von Schlechtendal secured it in 1879.

Black Troupial (*Quiscalus lugubris*).

Black, with vivid violaceous gloss; wings and tail with a slight greenish gloss; bill and feet black. Female smoky-blackish, with no violaceous gloss; wings and tail darker; bill, seen from above, slightly narrower towards base than that of the male. Hab., Trinidad, Venezuela, and Cayenne.

Burmeister publishes no field notes on this species beyond the fact that it lives in open spots by the road-side, and searches in horse-dung for beetles as food; nor can I discover anything else respecting the wild life. It reached the London Zoological Gardens in 1862, and the Amsterdam Gardens in 1886.

Chopi Troupial (*Aphobus chopi*).

Black, slightly glossy; bill and feet black; lower mandible of bill obliquely furrowed (sulcated). Female smaller and duller; the lower mandible of bill not sulcated. Hab., South Brazil, Paraguay, Northern Argentine, Bolivia, and Peru.

According to Azara (Apunt. I., p. 282) the Chopi is a highly sagacious bird, and although a frequent visitor to courtyards and verandahs of houses in Paraguay, too shy and suspicious to be caught with snares. It has a strong and easy flight, and readily attacks any large bird passing near, following it persistently in the air, or, pouncing down, fastens itself on its enemy's back. If the Caracara Eagle (*Polyborus*) alights in order to shake off its persecutor, the Chopi perches at a distance of a few feet, where it assumes an indifferent manner; but no sooner does the Caracara allow its attention to wander from its adversary, than it is again subjected to fresh insult. These attacks on so large and powerful a species may be regarded as mere impertinences, but by practising them the Chopi is soon able to rid himself of the presence of any unwelcome bird. From a long distance he recognises an enemy by its figure, or even its shadow, and warns all birds of the coming danger with a loud whistle, which at once sends them into hiding, while the Chopi goes bravely out to the encounter; and the result is invariably a victorious song on his part, beginning with the sound of his own name, and running through a variety of whistled notes. He also sings well in captivity, and when his mate is incubating, and his voice is first heard welcoming the dawn from the eaves and tiled roofs of houses where he roosts. The pairing season is in November; and Noseda adds: The breeding place is a hole in a bank or tree trunk, or in a wall under the eaves, and occasionally the nest is made in the small branches of an orange or other close-leafed tree, and is built of sticks and straws, carelessly disposed, with a few feathers for lining. The eggs are four, and white (*cf.* "Argentine Ornithology," Vol. I., p. 109).

Cassiques (*Cassicinæ*).

Black Cassique (*Cassidix oryzivora*).

Black, with a well-defined violaceous gloss; neck feathers lengthened and expanded; bill and feet black; irides red. Female much smaller and duller; neck feathers not expanded. Hab., South Mexico to Peru and Paraguay.

Mangelsdorff observes that this species is very Crow-like in behaviour, is bold, lives in companies, not so much in forest as in open places, where it is abundant in cattle-pastures; it struts about after the manner of a Crow, and feeds upon all kinds of grubs, which it picks up on the ground. The Brazilians not infrequently catch it and keep it in the house like a Jackdaw, where, moreover, it accepts all kinds of human food." Natterer met with it in Caiçara in January in flocks; on a maize-plantation with already fledged young in February and March; in small companies in the forest at the border of Lagoa do Chacururé, where they were very shy, in October and November; in Eugentio do Gama in small flocks in July, August and September; on the River Amazon and Para in December. In the crop of one male which he secured he found seeds. It settles on swine, seeking for ticks. The food, according to Mangelsdorff, consists of grain, rice, maize, etc., and insects.

Herr Kuschel (*The Ibis*, 1896) observes that he has eggs of this species found in nests of *Cassicus persicus*. He says: "The eggs that I possess were obtained near Pará, Brazil, by Mr. A. Schulz. This collector found amongst partially-incubated eggs of *Cassicus persicus* some that were larger in size and different in shape, and observed that females of *Cassidix oryzivorus* entered the nests of the *Cassicus*. Having shot a female of *Cassidix* while flying into a nest of the *Cassicus*, he found in its oviduct a mature egg resembling the larger eggs met with in the nests of the *Cassicus*. This egg, broken, is now in my collection." If confirmed, this would prove that *Cassidix* is sometimes parasitic.

In "Timehri," Vol. X., New Series, p. 37 (*vide The Ibis*, 1897), Mr. C. A. Lloyd published an article

entitled "Queer Homes," in which he described the breeding habits of this species:—"A cabbage-palm that I once saw was decorated in a most singular manner with the nest of the Black Bunyah (*Ostinops decumanus*). At the end of every arching frond was attached a long purse-like nest, and the whole were arranged as symmetrically as if placed there by human hands. While speaking of the Bunyah it may be as well to note that another hang-nest, the large Black Rice-bird (*Cassidix oryzivora*), seems never to build a home of her own, but contents herself with making use of the deserted Bunyah nests in which to lay her curiously-marked eggs." Dr. Goeldi, however, appears to have first discovered the parasitic habit of this species. In his "Aves do Brazil," p. 284, he says:—"The 'Meiro,' as it is called in the Serra dos Orgaos, introduces its eggs into the nests of other birds, and does not incubate itself." Moreover, in December, 1892, a nest and two young birds were brought to him as belonging to the "Japu" (*Ostinops cristatus*. He remarked that one of the fledglings had no yellow in the tail-feathers. As the birds grew older it became manifest that one of the supposed "Japus" was a young *Cassidix oryzivora*, while the other was that of *Ostinops cristatus*. In an article in *The Ibis* for 1897 Dr. Goeldi gives further particulars respecting this parasitic habit. On p. 364 he says:—"When I arrived in Pará, I was surprised at being told that the 'Graúna' has the habit of laying its eggs in the nest of the 'Japüm'" (=*Cassicus persicus*). I had thus an interesting confirmation of my own observations in Rio de Janeiro, and have come to the conclusion that *Cassidix oryzivora is parasitic everywhere, choosing in North and South Brazil for its eggs the nests of the respective Cassicine species, the size of which agrees best with its own.** In "Timehri," Vol. XI., New Series, Mr. Barshall says that this species deposits its eggs in the nests of *Cassicus affinis* and *C. persicus*. Mr. W. Goodfellow (*The Ibis*, 1901, pp. 479-480) says:—"They were not met with at a higher altitude than about 3,000 feet. During the first week or two of our stay at Santo Domingo we never saw one of them, then a large influx took place, and many could be observed all day and every day about the clearing, but never within the forest. They frequented the banana-plantations, and we often shot them while they were eating the ripe fruit. We also frequently saw them alone and in the company of *Crotophaga ani*, sitting on the backs of the sleeping cattle or on the ground around them. At both Santo Domingo and San Nicolas they were called 'Garapateros' (tick-eaters), and *Crotophaga ani* was called 'Chamom.'

"When whistling they expand the thick feathers on the neck like a ruff. The females are much smaller, and black without the purple gloss. Iris yellow, but less bright in the young. I found grasshoppers in the stomachs of three examples." In *The Ibis* for 1902, p. 210, he says:—"In a wild state *C. oryzivora* does not appear to be evilly disposed to smaller birds, which is more than can be said of it in captivity." Russ says that this bird is extraordinarily rare in the German bird-market; it reached the Amsterdam Zoological Gardens in 1874, and Russ knew of a specimen in the Berlin Gardens. Messrs. Russell Humphrys and Reginald Phillipps have both had specimens, and the latter gentleman gives a short account, describing the apparent conceit of his bird, in *The Avicultural Magazine* for March, 1898, First Series, Vol. IV., p. 100. He gives the Dutch name *Zwarte Kivispaal*.

* The eggs, according to T. K. Salmon ("Proceedings of the Zoological Society," 1879, p. 510), are white; axis 1.45 and diameter 1.15. It is likely enough that the much smaller egg belonged to the host.

Mexican Cassique (*Cassiculus melanicterus*).

Glossy black; lesser wing-coverts, rump, anal tuft, and tail yellow, the latter, however, with the two central feathers and outer edges of the others black; bill white, leaden-grey towards the base; feet blackish. Female smaller, greyer, the yellow parts of the plumage paler; bill smaller and weaker. Hab., Western Mexico.

C. W. Beebe ("Two Bird-lovers in Mexico," pp. 282, 283) observes:—"The most abundant birds in this locality were the beautiful yellow-and-black Mexican Caciques, great tropical Orioles, which are so characteristic a feature of equatorial countries. As in the virile warmth of Mexico many things are carried to an extreme which in the North are developed but moderately, so with the nest of the Orioles. Our Baltimore Oriole builds a long, shapely purse, deep-cradled and elm-swung, where its eggs and young are exposed to but few dangers. It is said that in the south of the United States, owing to the increase of heat, the nests are shallower, more vireo-like. Yet in the tropical heat of Mexico the nests of the Orioles are three and four feet in depth, hung from the tips of branches, and waving in every breath of air. They are finely woven of reeds, open-meshed, but tough and difficult to tear. A small entrance at the top leads down through the long, narrow neck to the globular nest-chamber at the bottom.

"The morning flight of these *Calandrias*, as the Mexicans call them, was one of the delights of our camp life. Jet-black birds they were, long-crested, with brilliant yellow shoulders, lower back and tail, save the two inner feathers. The ivory-like beaks were long and needle-like, such as a master weaver's should be. They came from the northward, as if the bats of the night before had been transformed by some witchery of the morning sun, and were returning in this guise. Hundreds of the yellow-and-black forms flashed through the trees, flock after flock of fifty or more, spreading through all the woods in smaller companies to feed. As they passed, their wings made a strange, whip-like humming sound, which rose to a continuous murmur when a large number flew past at once."

I have discovered no other field notes on this species. It was added to the Zoological Society of London's collection of living animals in 1865.

Yellow Cassique (*Cassicus persicus*).

Glossy black; a large patch on the wing-coverts, the lower back, anal tuft, and basal half of tail bright yellow; bill pale lemon-yellow; feet back; irides blue. Female smaller, of a duller black above, and browner below; the yellow in the plumage paler; bill much smaller and weaker. Hab., South America from Colombia to South Brazil and Bolivia.

W. A. Forbes (*The Ibis*, 1881, p. 338) says:—"This is one of the commonest and most characteristic birds of the country near the coast, where it is very abundant, and may be seen commonly, even in the neighbourhood of Recife, nearly everywhere where cocoa-palms grow. It usually gets about in small parties of about four or five, which keep up, when perched, a continuous chattering, often leading to their discovery before being seen themselves. Towards evening they seem to collect in larger parties, as at that time numbers might often be seen returning homewards, always flying in the same direction, and usually making for a clump of palms, on which no doubt to pass the night. In the

interior it is much less common, and I often went several days without seeing one. The Brazilians call it 'Sheshou,' and keep it often in cages."

Dr. Goeldi, describing a visit to South Guyana (*The Ibis*, 1897, page 152), says:—"A shrub laden with half a dozen hanging bag-nests, only a few steps distant from our steamer, was the animated place of exercise for a colony of *Cassicus persicus*. They were also breeding at this time. I got several eggs from the nests, and among them some slightly different in colour and shape, which evidently belonged to another species, with Cuckoo-like habits."

Mr. W. L. S. Loat says (*The Ibis*, 1898, p. 561):—"On the Lamaha Canal we found both the nests of the Scarlet-backed Mocking-bird (*Cassicus affinis*) and of *Cassicus persicus*. The two species had chosen two large bushes close to the water's edge, and about twenty yards apart, in which their nests were built. One bough contained three or four nests, all woven close together."

Mr. W. Goodfellow, in his account of a journey through Colombia and Ecuador (*The Ibis*, 1901, p. 447), says:—"A series from the Upper Napo, East Ecuador. They were nesting there in May and June, and on one tree I counted sixty-two of their hanging nests. They prefer tall trees standing well out in the clearings, or those on the edge that rise above the general forest level. Each of the nests that I took contained five young, which varied considerably in size. Even before these are fledged they run up the inside of the nests to be fed at the opening at the top, and before they can fly they sit about on the outside, but rapidly vanish inside at the sight of a Hawk or any other large bird. In the young the black parts are of a rusty colour, with a strong yellowish hue about the lower part of the breast and thighs, which gives them an almost olive-green appearance. The bills of the adult birds are pale lemon-yellow (not 'white,' as stated in the British Museum Catalogue), and the iris is pale blue; but in the young the bill is grey, with a yellow tinge at the tip, and the iris is dark grey. The Ecuadorians call them 'Culembras,' but the Napo Indians called them 'Chaupi mangas.'"

According to Burmeister, the nest is formed of stalks and plant-fibres, is purse-shaped, and suspended from tall trees; the eggs are bluish-white, dotted with brown, and are somewhat globular in shape. Russ says that it appears rarely and singly in the trade. It reached the London Zoological Gardens in 1864, those of Amsterdam in 1865. Later, E. von Schlechtendal secured three males, and since then it has always appeared at the larger exhibitions and in the collections of certain aviculturists. Mr. Schlechtendal, not being able to obtain females, turned one of his Cassiques into the room with his African and Indian Starlings, and it drove them here and there in the wildest terror, and so knocked them about that he was obliged to remove it again to a cage. He was also obliged to keep all three examples separately. Russ says that in 1894 this species built nests in the Berlin Zoological Gardens.

Red-rumped Cassique (*Cassicus hæmorrhous*).

Smoky blue-black; rump scarlet; bill greenish white; feet black. Female smaller and greyer, brown where the male is blue-black, the scarlet on the lower back restricted; bill shorter. Hab., S.E. Brazil.

Burmeister says ("Systematische Uebersicht," Part III., p. 275):—"One of the most abundant birds in the whole of tropical Brazil, especially in winter (May to July), where it is fond of coming into the gardens to seek the ripening oranges; it nests on isolated, lofty trees, often standing apart in the road or in front of detached houses, where the nests, which are over 2ft. in length, resembling a shot-bag in outline, and loosely woven of all kinds of dry stalks and strips of grass, are much in evidence. The entrance-hole is slightly below the middle in the form of an oval opening without passage, through which the bird slips inside; one can see the brooding bird through the nest and recognise remarkably well its red rump. The eggs are as large as those of the Yellow Thrush, bluish-white, sparely spotted with violet, and rarely to be found in greater numbers than two. The note of the bird is loud, piercing, somewhat clearer than that of the Jackdaw, and where several of them are together one always hears them crying to one another in many tones; when alone the bird is quiet, and feeds in the tree-tops without betraying itself." *

Russ says this is commoner than the other species in the trade, and therefore it can always be found both in zoological gardens and in the hands of large collectors and aviculturists. It first reached the London Zoological Gardens in 1873, those of Amsterdam in 1884; Schlechtendal had a specimen in 1877. Since 1890 Miss Hagenbeck and A. Fockelmann have imported a good many. In 1892 Russ secured a pair and turned them into his bird-room, where, to his surprise, they proved in no way malicious, but behaved most peaceably and harmlessly towards even the smallest birds, including Waxbills and Grassfinches; but no sooner had they completely settled down and got used to their surroundings than they began to peck and chase the small birds, seizing them by a leg, etc., and so they had to be removed.

Crested Cassique (*Ostinops decumanus*).

Black, with chocolate rump and anal tuft; two central tail-feathers black, the rest yellow; bill yellowish-white; feet black; irides pale blue. Female smaller, the chocolate of lower back and rump paler; bill much shorter and less powerful. Hab., Chiriqui, Panama, and South America to South Brazil and Bolivia.

According to Burmeister ("Systematische Uebersicht," Part III., p. 276), this species "keeps in the vicinity of large forests and farther from human dwellings than the preceding bird. Its behaviour is wiser, more cautious, yet for the most part like that of the aforementioned. It nidificates in large, purse-shaped, loose-hanging nests, and lays two eggs, whitish spotted with violet, ornamented between the spots with blackish streaks. I met with the bird at the Organ Mountains, where it generally appeared in small parties high in the air above the forest, and was recognisable at once by its yellow tail. Later I had the chance during my visit to the Puris (see my expedition, p. 261) to see a great tree standing alone which was hung with the nests of the bird. Here, as also at Lagoa Santa, specimens were obtained. It is, especially with the Indian population, a favourite article of diet. Its food consists of insects of all kinds and ripe tree-fruits, for preference guavas and oranges."

This species reached the London Zoological Gardens in 1873, 1876, and 1877; and, according to Russ, that is all we know about its life in captivity.

* Eugène André ("A Naturalist in the Guianas," pp. 220, 221) says: "It is a curious fact that these birds almost always hang their nests in close proximity to the hives of the marabunta. There must be some understanding between the birds and these terrible insects, otherwise how can we account for hives and nests being sometimes so close together that the birds, in the frequent visits they make to their nests while feeding their young, have to brush past the marabunta hives? There is, moreover, a good deal of resemblance between the nests and the hives."

Hangnests (*Icterinæ*).

Baltimore Hangnest (*Icterus baltimore*).

Above black; primaries with white edges to the feathers; greater coverts with broad white tips; middle tail-feathers orange at base; remaining feathers orange with the exception of a sub-basal black band; the black of the throat extending to the middle of chest, otherwise bright orange; upper mandible black; lower mandible greyish-blue with dusky tip; feet greyish-brown; irides brown. Female much smaller, olivaceous-greyish on the back; wing-feathers with pale or white edges; front of crown and upper tail-coverts yellowish-olivaceous; throat and centre of abdomen buffish; breast dull orange; sides, flanks, and tail greyish-olivaceous; under tail-coverts orange-ochreous; bill more slender than in male. Hab., "North America, from Atlantic coast to high central plains (in summer), and throughout Mexico and Central America to Panama and Sierra Nevada of Santa Marta" (P. L. Sclater); accidental in Cuba (Ridgway).

Captain Bendire says ("Life Histories of North American Birds," Vol. II., pp. 483-486): "Their favourite haunts in our Eastern States are found in rather open country, along roads bordered with shady trees, creek bottoms, orchards, and the borders of small timbered tracts."

"A very peculiar note, a long-drawn-out, chattering 'chaë, chaë, chaë,' is apt to draw one's attention to it on its first arrival, and this is more or less frequently uttered throughout the season. This note is difficult to reproduce exactly, and I find its songs still more so. One sounds like 'hish, hish, tweet, tweet'; another something like 'whee-he-he, whee-he-he, oh whee-he-he-woy-woy.' This last is much more softly uttered than the first. Mr. T. Nuttall describes one of their songs as 'tshippe-tshayia-too-too-tshippe-tshippa-too-too,' and there are others impossible to render. The young, after leaving the nest, utter a note like 'he-he-häe,' and another like 'heek-heek-he,' varied occasionally by a low twittering. Shortly after their arrival they sing almost incessantly when not eating; but later in the season, when they have their always-hungry family to provide for, they are more silent. Their flight is strong, swift, and graceful, and they are far more at home on the wing than on the ground, where they are seldom seen, except when picking up some insect or in search of nesting material.

"In the vicinity of Washington, District of Columbia, nidification commences about the middle of May, and full sets of eggs may be looked for the last week in this month, while in Central New York, Connecticut, Wisconsin, Southern Minnesota, etc., they usually nest from eight to fourteen days later.

"Ordinarily the nest of the Baltimore Oriole is pensile, and is usually suspended by the rim from the extremities of several slender branches, to which it is attached. Others, besides being fastened by the rim, which is always neat and smoothly finished, are attached to some perpendicular fork or limb by one of the sides, thus steadying the nest and preventing it from swinging too much during heavy winds. In a truly pensile nest some of the eggs are occasionally cracked by the violent swaying of the slender twigs to which it is attached, while if fastened at the side this occurs very rarely, unless the entire limb is torn off. Both sexes assist in nest-building. The materials used for the framework consist principally of decayed fibres, such as those of the Indian hemp (*Apocynum androsæmifolium*), the silk of milkweed (*Asclepias*), nettles (*Urtica*), and, when located near human habitations, of horsehair, bits of twine, yarn, strips of grape-vine bark, etc. With such materials a strong purse or pouch shaped nest is woven and firmly attached to one or more forked twigs by the slightly contracted rim, and it is usually placed in such a position that the entrance is well shaded by leafy twigs above. All sorts of materials are used in lining the bottom and sides of the nest—cotton, wool, tow, rags, cattle-hair, fur, fine strips of bark, tree-moss, fine grass, and plant-down.

"The colour of some of the nests varies considerably, according to the materials used; some look almost white, others a pale straw colour, and the majority smoke-grey.

"The nests are usually suspended from long, slender, drooping branches of elm, maple, birch, weeping willow, buttonwood, sycamore, oak, aspen, poplar, Norway spruce, apple, pear, and wild cherry trees; but in some localities they are built in the very top and centre of a tree, where it is almost impossible to see them. They are placed at various heights from the ground, from 8ft. to 50ft. and more, and frequently in utterly inaccessible positions. The Baltimore Oriole is tolerant and amiably disposed toward its smaller neighbours, and such are often allowed to nest in the same tree, and occasionally within a few feet of its own nest.

"Incubation lasts about fourteen days, and I think the female attends to this duty almost exclusively. Both sexes are extremely devoted to each other, as well as to their eggs and young, defending these bravely against all intruders. From four to six eggs are laid to a set, most frequently four, though sets of five are not uncommon, while sets of six are rather rare. One is deposited daily, and only one brood is raised in a season. The young are able to leave the nest when about two weeks old, and may then be seen sitting on some of the branches close by and clamouring for food. They are fed entirely on insects, etc.

"The eggs of the Baltimore Oriole are usually elongate in shape, more rarely ovate. The shell is fine grained, moderately strong, and shows little gloss.

"The ground colour is ordinarily pale greyish-white, one of those subtle tints which is difficult to describe; in a few cases it is pale bluish-white, and less often the ground colour is clouded over in places with a faint, pale ferruginous suffusion. The egg is streaked, blotched, and covered with irregularly shaped lines and tracings, generally heaviest about the larger end of the egg, with different shades of black and brown, and more sparingly with lighter tints of smoke, lavender, and pearl grey. In a few instances the markings form an irregular wreath, and occasionally a set is found entirely unmarked."

Russ says that this species reached the Amsterdam Zoological Gardens in 1839, the London Gardens in 1871, and it has always been common in the German Gardens. In the bird market it is always readily bought, and its price varies from 15 to 18 marks a specimen—rarely less. It certainly is not common in the English market, for I have never seen it in any bird-shop, though I believe I have seen it at one or two shows.

Black-sided Hangnest (*Icterus abeillei*).

Above black; median and greater wing-coverts and outer margins of flights white, but the concealed inner webs of the greater coverts black; two middle tail-feathers, inner webs of the next pair and tips of the remainder, black; otherwise the tail is bright yellow; a short eyebrow-stripe to above eye yellow; under surface bright yellow washed with orange; chin, middle of throat, and flanks black; bill greyish-black; lower mandible bluish, with dusky tip; feet blackish. Female above grey, washed with olive-yellowish on head; feathers of back with darker centres; greater wing-

coverts and flights with pale grey margins, the median and greater coverts tipped with white; tail yellowish-olive; cheeks, sides of throat, and chest yellowish; chin and throat with an ill-defined dusky central streak; sides, flanks, and under tail-coverts greyish, the latter washed with yellowish; middle of breast and abdomen whitish. Hab., Southern and Central Mexico.

I have come across no notes on the wild life of this bird; it was represented in the London Zoological Gardens in 1870.

Orchard Hangnest (*Icterus spurius*).

Above black; lesser wing-coverts and rump and upper tail-coverts chestnut; median wing-coverts and flights with narrow whitish edges; outer tail-feathers with narrow white tips; neck and throat black; remainder of under-surface chestnut; bill black, with basal half of lower mandible bluish-white; feet greyish-black; irides brown. Female yellowish-olive above, paler and more yellow on upper tail-coverts and tail; back duller with slightly darker centres to the feathers; middle and greater wing-coverts with broad whitish tips; under-surface dull yellow, washed on sides and flanks with olivaceous; vent bright ochre-yellow; wings dusky with greenish-grey or whitish edges; bill shorter, but broader at base. Hab., "Eastern North America (in summer), and southward through Mexico and Central America to Panama" (P. L. Sclater).

Captain Bendire says ("Life Histories," Vol II., pp. 479-482): "It is a restless, impulsive, but well-disspositioned bird, on good terms with its neighbours, and though not particularly shy, it is nevertheless difficult to observe closely, as it generally conceals itself in the densest foliage while at rest, or else flits quickly about from twig to twig in search of insects, on which it lives almost exclusively throughout the summer months.

"Its favourite haunts, as its name implies, are orchards, and when the apple and pear trees are in bloom and the trees have commenced to leaf one may look for the Orchard Oriole. It is generally found in rather open country, interspersed here and there with small groves; also among the shady trees along country roads, and in the prairie States among the trees and shrubbery along streams, preferring such localities to heavier-timbered sections and forest regions.

"Its song, most often heard in the earlier spring, is uttered in a quick, hurried manner. Its loud, clear strains, indicating its impulsive nature, are poured forth with such rapidity as to be difficult to describe, and I shall not attempt it; but they remind me somewhat of those of the Warbling Vireo, only sounding louder and clearer. A chattering, querulous note, when disturbed or alarmed from any cause, is also uttered.

"Few birds do more good and less harm than our Orchard Oriole, especially to the fruit-grower. The bulk of its food consists of small beetles, plant lice, flies, hairless caterpillars, cabbage worms, grasshoppers, rose bugs, and larvæ of all kinds, while the few berries it may help itself to during the short time they last are many times paid for by the great number of noxious insects destroyed, and it certainly deserves the fullest protection."

"Both sexes assist in nest-building, and generally finish one in from three to four days. The nests are placed in trees or bushes from 6ft. to 40ft. from the ground, usually from 12ft. to 20ft., in a great variety of trees, less often in conifers than in deciduous kinds." "In the South the Orchard Oriole nests occasionally in the grey moss (*Tillandsia usneoides*) so commonly found hanging from many of the trees there."

"The location and manner of attaching its ingeniously woven, basket-like nests vary greatly. Some are set in a crotch formed by several small twigs; the bottom of the nest occasionally rests on and is supported by these, and again in similar locations it is unsupported, but the sides are securely fastened to several of the twigs among which it is placed; then, again, some are built in a fork of a horizontal limb, like the nest of an Acadian Flycatcher or a Vireo, both sides of the nest being fastened to the fork in which it is placed; again, it may be fastened to some suitable twigs by the rim only, in the manner of a hammock. Comparatively few, excepting those of the last style and those built in moss, can really be called pensile or even semipensile nests. They also vary greatly in bulk and depth."

From what Captain Bendire says the nests seem to be most frequently composed of green wiry grass and lined with plant-down, and he says that the green colour is often retained for years.

"From four to six eggs are usually laid to a set (mostly five), and one is deposited daily. Incubation lasts about twelve days, and I am of the opinion that this duty is exclusively performed by the female. I have never seen the male on the nest, but have seen him feed his mate while incubating. I believe, as a rule, only one brood is raised in a season."

"The eggs are mostly ovate in shape, but occasionally a set is found which is decidedly elongate-ovate. The shell is moderately strong, close-grained, and without gloss. The ground colour is usually pale bluish-white, and this is sometimes faintly overlaid with pale pearl-grey or greyish-white. The markings, which are nearly always heaviest about the larger end of the egg, consist of blotches, spots, scrawls, and tracings of several shades of brown, purple, lavender, and pearl-grey, varying in amount and intensity in different specimens. In the majority of the eggs before me the darker markings predominate, but the lighter-coloured and more neutral tints are nearly always present to a greater or less extent."

Russ speaks of this Hangnest as a bird eagerly purchased in Germany, and usually obtainable, occasionally imported by Reiche and Ruhe in a considerable number, but the female more rarely; its price is comparatively low—5 to 10 marks apiece, and at most 12 to 15 marks. Yet in England I have never seen a living example; it has, however, been exhibited in our London Gardens.

Chestnut-shouldered Hangnest (*Icterus pyrrhopterus*).

Black; upper lesser wing-coverts chestnut; bill black; feet dark brown. Female much smaller and doubtless with a shorter bill. Hab., South Brazil, Paraguay, Argentina, and Bolivia.

Hudson says ("Argentine Ornithology," Vol. I., pp. 107, 108): "This interesting bird, the only *Icterus* found in the Argentine Republic, ranges south to Buenos Ayres, where it is migratory, and appears in small flocks of six or eight individuals in September; but soon after arriving these little companies break up, and the birds are subsequently found singly or in pairs in the woods along the Plata River."

"It is a loquacious bird, most of its tones being low and pleasing; exceedingly restless in disposition, incessantly passing from tree to tree, jerking its long tail and clinging to the branches in various attitudes, while searching for insects in the decayed bark. While thus engaged it utters a great variety of chirping and guttural sounds, interspersed with short agreeable notes. It also has a song of considerable merit, low and varied in tone, with a peculiar ventriloquism in many of the notes which produce a confusing idea on the listener that the bird approaches and recedes alternately whilst uttering

them. While singing the bird continues moving, but always concealed in the thick foliage, and it is probably this constant turning about of the singer, and the notes coming through leafy screens of varying density, which makes the ventriloquism and gives so much light and shade to the mysterious melody.

"The first bird of this species I shot was wounded very slightly in one wing and fell into a stream; to my very great surprise it began singing its usual song while floating about on the surface, making no attempt to swim. After fishing it out it continued to sing at intervals in my hand; how strange it was to hear this bleeding, captive bird warbling out soft, sweet notes which seemed to express only pleasant emotions! Yet it was evident that the bird was fully alive to its danger, for it struggled violently to escape and bit my finger savagely with its sharp beak.

"I subsequently found a nest; it was about 7in. deep, composed entirely of lichens gathered from the boles of trees, ingeniously woven together and suspended from the small twigs and leaves at the extremity of a branch. There were no eggs in it, but the birds fluttered in great trouble about me, and, what surprised me, uttered a variety of *singing* notes, unlike their usual song, but many of them closely resembling the notes of other songsters, which made me think that this *Icterus* possesses the mimicking faculty to some extent."

Though many collectors speak of this as a common bird, I have been unable to find a description of the eggs. Russ speaks of it as unfortunately extremely rare in the market; indeed, he seems only to have known of one example in the Berlin Zoological Gardens. Touching Hudson's remarks respecting this bird singing when distressed, it is by no means the only Starling which does so. You can make the Crested Mynah sing by catching it and holding it in your hands. Most Starlings are clever mimics.

Yellow-crowned Hangnest (*Icterus chrysocephalus*).

Black; the crown, forehead excepted, upper lesser wing-coverts, under wing-coverts and thighs yellow; bill and feet black; irides brown. Female similar in plumage, but doubtless with a shorter bill. Hab., "Colombia, Venezuela, Guiana, and Amazonia" (P. L. Sclater.)

Mr. H. Whitely obtained this species on Roraima at a height of 3,500 feet (*The Ibis*, 1885, p. 218).

Spix found this species singly in forest on the Rio Negro, where it was not rare, but in Guiana and Colombia it was abundant. It sings very prettily, according to Pelzeln, and that appears to be all that has been published respecting its wild life.

The London Zoological Society purchased an example in 1886, and in 1893 Miss Hagenbeck exhibited another at the exhibition of the "Ornis" Society.

Yellow-shouldered Hangnest (*Icterus tibialis*).*

Black; lesser upper wing-coverts, under wing-coverts and thighs yellow; bill black; feet bluish-grey; irides red-brown. Female similar in plumage, but doubtless with a shorter bill. Hab., South-east Brazil.

Burmeister ("Systematische Uebersicht," Vol. III., pp. 271, 272) says that this Hangnest "lives chiefly in pairs in bushy regions, prefers river banks, feeds on insects and nearly ripe fleshy fruits, and has a not unpleasing song, which attempts to mimic the notes of other birds like that of our Starling. Nidificates in purse-shaped, pensile nests, openly woven of dry stems, and lays whitish-blue eggs, speckled with red-brown." W. A. Forbes says (*The Ibis*, 1881, p. 339):—"This bird I first observed at Quipapá, where it was not uncommon in the vicinity of the town, flying about in small companies of twos and threes. I afterwards found it at Macuca and Garanhuns, and saw a single specimen in the garden at Cabo a few days before I sailed, though I did not see the species at all during my previous stay there. The bird is also found at San Lorenzo, a village about twenty miles west of Recife, as a living specimen I bought in Recife came from there. The bird is not rarely to be seen caged in the houses of the Brazilians, who call it "Sheshou de Banancira," to distinguish it from the common "Sheshou" (*Cassicus persicus*). It is also sometimes called "Soldado," or soldier. I succeeded in bringing three specimens alive to London, two of which are still living in the Zoological Gardens, where it has not before, I believe, been exhibited alive."

According to Russ, this bird was first imported into Germany early in 1870, and both Jamrach of London and Bekemans of Antwerp have introduced it several times into the market. Prince Ferdinand of Bulgaria possessed it in 1878; but Mr. Forbes, in 1880, was the first to add it to the London Zoological Society's collection. Since then it has always come over occasionally if not very often, and always singly.

Wagler's Hangnest (*Icterus wagleri*).

Black; rump, abdomen, and anal tuft bright cadmium yellow; slightly tinged with chestnut close to the black of the chest; bill black, the lower mandible pale greyish-blue towards base; feet leaden grey; irides brown. Female smaller, and with shorter bill. Hab., Mexico and Guatemala.

Mr. C. W. Beebe ("Two Bird-lovers in Mexico," Appendix, p. 392) says of this species: "Abundant in the barrancas about Guadalajara and from Tuxpan to the Pacific," and at p. 149 he observes: "Orioles soon made their appearance, a flock of them, somewhat like our Baltimores, but larger and with jet black wings and tail—the Wagler Orioles. Their gaudy costume of orange and black is not acquired until the third year, and during the first two seasons the immature birds have to be satisfied with more sombre tints of light yellow and green. These birds, too, have renounced song for their coat of many colours, and can only rattle harshly. Their alarm-note is hard and metallic, like that of a Nuthatch."

The above is all that I have discovered respecting the wild life.

According to Russ, it has hitherto only appeared in the London Zoological Gardens, where it arrived in 1876.

Black-winged Hangnest (*Icterus giraudi*).

Bright yellow, tinged with orange; front and sides of head, throat to middle of breast, wings, tail, bill, and feet, black. Hab., S. Mexico, Yucatan, Guatemala, and throughout Central America to Venezuela and Colombia.

Mr. G. H. Gurney purchased an example of this rare Hangnest early in 1909.

Golden Hangnest (*Icterus xanthornus*).

Bright golden yellow, slightly washed with olive between the shoulders; wings, excepting the lesser coverts, black; greater coverts, secondaries, and bases of primaries edged with white; greater coverts with white tips; tail black, the lateral feathers more or less broadly edged with whitish at the tips, the concealed bases of the feathers yellow; lores black; naked orbital

* Dr. Russ confounds this species with the closely related *I. cayanensis*: his description and observations certainly apply to *I. tibialis*.

region described as black, probably greyish-blue in life; anterior edge of cheeks, chin, throat, and centre of breast black; bill shining black, the lower mandible with a basal patch of pale blue-grey; feet bluish-flesh-coloured; irides yellowish-white or pale yellow. Female smaller and with shorter bill. Hab., "Caribbean coast district of northern South America, from Cayenne to Colombia, Trinidad, and Margarita Island, Isthmus of Panama (?)." (Ridgway.)

Ridgway separates an insular form as a sub-species under the name of *I. curasoensis*, differing in its longer bill, the young much paler than that of *I. xanthornus*

BRAZILIAN HANGNEST.

(typicus). Hab., Islands of Curaçao, Bonaire, and Aruba.

Burmeister ("Systematische Uebersicht," Vol. III., p. 270) says that this species "lives upon bushy ground, but not exactly in deep primæval forest; it is seen singly or in pairs at the breeding-season, and builds a long, openly woven purse-shaped nest of grass stalks, which is suspended freely from the twigs in the bush. The eggs are pale bluish-white, tolerably thickly spotted with red-brown, with somewhat darker spots at the blunt end."

Of the form from Curaçao Dr. Hartert says (*The Ibis* 1893, pp. 295, 296):—"The specimens from Curaçao all agree, but two males from Aruba have the bills shorter and stronger, and also the yellow colour brighter and more tinged with orange."

"It is, I think, very interesting that the birds from Aruba, the island nearest to the continent, agree better with the continental form than those from Curaçao. The bird is equally common on all three islands, but only where it finds sufficient trees in which to build its long, hanging nest. I have not procured skins from Bonaire, but the birds there agree with those from Curaçao. I got an egg on the 22nd of July in Bonaire. The colour is of a pale bluish-white, sparingly covered with long and fine deeper-lying cinereous hair-lines and overlaid patches and lines, like Arabian letters, of a deep purplish-brown, more frequent on the thicker end. It measures 0.93in. by 0.67in., and the weight of it is 250 milligrammes. "The bird is sometimes kept in captivity, but is not much appreciated. Its piping notes are less clear than those of *Icterus vulgaris*, and they produce many screeching and mewing sounds."

Russ says that this is one of the very rarest of imported birds; he only knows of a specimen which reached the Amsterdam Gardens in 1882; but in 1906 Mr. E. W. Harper brought home and presented a specimen to the London Zoological Gardens, and doubtless others will come from time to time.

COMMON HANGNEST (*Icterus vulgaris*).

Brilliant cadmium-yellow, deepest and brightest on the breast; entire head, neck, elongated throat feathers extending over middle of fore-chest, a broad belt between the shoulders, wings and tail black; lesser wing-coverts yellow; a broad, longitudinal white belt (slightly yellowish in old birds), including the median coverts, inner greater coverts, and broad borders to inner secondaries; orbital naked skin, forming an imperfect fusiform zone, enclosing the eye, pearl or blue-grey; bill black, with a large whitish ash patch at base of lower mandible; feet pearl-grey, slightly yellowish at proximal end of tarso-metatarsus; irides pale or bone-yellow. Female slightly smaller, with considerably shorter bill. Hab., "Coast-region of Colombia and Venezuela and Trinidad." (Sclater.) "Margarita and Curaçao. Introduced into West Indian Islands of St. Thomas, Porto Rico, and Jamaica." (Ridgway.)

In 1907 I separated a form as a sub-species under the name of *I. limonensis*, believing it to be that indicated by Herr Peters as occurring in the island of Curaçao, on the ground of its more slender outline, its pale colouring, the naked orbital marking reduced to a small triangle behind the eye, and the outer tail-feathers having white external margins; its songs are many and varied, instead of uniform and monotonous: a good coloured plate was published with my article (*The Avicultural Magazine*, New Series, Vol. V., pp. 225-230). Later the pale colouring proved to be a sign of youth, but all other characters persist.

In the "Journal für Ornithologie," 1892, Peters says

that *I. vulgaris* occurs on Curaçao, and is said to be paler than the continental form; but Dr. Hartert says: "My birds, on the contrary, have very bright colours." He adds that they are rather short-winged, but those from Santa Marta in the British Museum are quite similar. Further on he says: "I did not find any nests; but, as everybody on Curaçao knows, they are totally different from those of *Icterus xanthornus* in not having the long tube.

"This bird is much appreciated as a cage-bird on account of its pure flute-like notes, and is often sent for sale from Venezuela. This species is not rare in certain places, such as the rocky hills covered with brushwood and cactus, both on Aruba and Curaçao, but it is absent from Bonaire, thus indicating its immigration from the Continent. I saw it in the bush on St. Thomas, where it has already been stated to occur by Ridgway. It may have been introduced into that island; but, on account of other affinities between the ornis of St. Thomas and that of Curaçao, this is very questionable." (*The Ibis*, 1893, pp. 297, 298.)

My first example of this species was sold to me under the name of "Brazilian Hangnest" in 1899, and I described it as that species in *The Avicultural Magazine*, First Series, Vol. VIII., pp. 293-295. It twice opened its own cage-door and escaped into my conservatory, where it took twenty minutes to catch it; subsequently I put a double fastening on the cage-door. When singing he stands high on his feet, throws back his head, with the bill pointing straight upwards, and raises the long feathers on the throat; then he begins to make a clicking sound, which can be imitated by pressing the tongue against the palate and removing it suddenly, or a rattling purring note, which can be reproduced by closing the lips, humming and simultaneously vibrating the soft palate; then the song begins now and again with a clearly whistled *Hookaree, hookaree*, sometimes repeated half a dozen times as a prelude, but by no means always; the true song follows —a quickly-repeated resonant whistle, *heo, heo, heo, heo, heo, heo, heo, heo* in a loud tone, and then a little lower: it never varies except in the number of repetitions of the monotonous note.

In December, 1906, Miss Joan Gladstone sent me her Hangnest, which struck me as being quite distinct from my first bird in the characters already indicated, and when it began to sing I felt sure that it was, at least, a different sub-species: it never introduces the characteristic *Hookaree* as a prelude, and instead of the monotonous whistle it has certainly nine (possibly more) variations in its songs. I recorded these in my paper previously referred to, the two most frequently uttered being "*Or-yer, hurri-er, haw, hee; chutcha-caw, chutcha-caw, chutcha-caw, chutcha-caw, chutcha-caw; hee*" (or "*ar hee*"), and the other begins either with the note "*Heer,*" or sometimes "*Or, ah, hee,*" and then "*hippoopoo peer, hippoopoo peer, toodle-year, ar hee.*" These Hangnests are nice birds; but, woe betide any small bird that comes within reach of their bills. I had a beautiful male Cordon Bleu in the next compartment to my lemon-coloured specimen, and one day it foolishly rested a moment on the wire partition; in a moment it was seized with bill and claw, half its wing feathers torn out, and a great hole pecked in the side of its head: another day a Zebra Finch lost a great bunch of feathers, but escaped without further injury.

The correct food for this and all the Hangnests is the same as for Tanagers—a good insectivorous mixture containing plenty of yolk of egg (the first thing they select, as all insectivorous birds do), plenty of ripe fruit—grapes, sweet orange or pear and banana—and a few insects or spiders when obtainable.

Brazilian Hangnest (*Icterus jamacaii*).

Bright reddish orange; head and throat, scapularies, wings excepting lesser coverts, and tail, black; outer borders of secondaries broadly white, forming a conspicuous patch; bill almost black, the base of lower mandible pearl-whitish; feet black; naked orbital lozenge pearl grey; irides pale primrose or bone yellowish. Female smaller, and with noticeable shorter bill. Hab., S.E. Brazil.

Burmeister ("Systematische Uebersicht," Vol. III., p. 269) says: "In the interior of Brazil, in the forests of the Campos region, it lives singly or in pairs; in the winter in small parties; it soon betrays itself by its changeable voice with various notes, and for that reason is frequently kept in cages. I met with the bird in the environs of Lagoa santa, but had no opportunity of securing it." "Its food consists of insects, especially soft maggots and larvæ, which it searches for on the ground; yet (like the species of *Cassicus*) it takes toll of ripe fruit, especially oranges,, and comes after them even into the gardens of the settlers."

This beautiful species has always been fairly common

Brazilian Hangnest.
(*Head and shoulders of male.*)

in the bird market, though not enough so to make it a cheap bird; Russ puts the price at from 18 to 24 marks a specimen, which is rather higher than it generally runs in England; I should think 15s. to 20s., either for this or the Common Hangnest (which is always confounded with it), would be about the usual price for freshly imported specimens. Of course, thoroughly acclimatised examples in perfect plumage would be worth more. I purchased a male of this species on August 13th, 1897, but it was in poor condition and out of health, so that it only lived thirteen days. It was quite tame—friendly even—and in spite of its state of health made a few attempts to sing, the notes being clear, mellow, and pleasing. I fed it on orange, banana, soft food, and mealworms.

The Brazilian Hangnest first reached the London Zoological Gardens in 1860, and those of Amsterdam in 1865. Why the name *jamacaii* was given to the species I do not pretend to know, but Russ says that the bird was supposed to have come from Jamaica, which was, of course, an error, and then he makes matters still worse by altering it to *jamaicensis*. *Jamacaii* means nothing, but *jamaicensis* is mischievous and misleading.

YELLOW-BACKED HANGNEST (*Icterus croconotus*).

Nearly resembling the preceding species, but the crown of the head, excepting the forehead and the scapularies, bright orange. Hab., "Guiana and Amazonia to Ecuador and interior of Brazil." (P. L. Sclater.)

Mr. W. Goodfellow (*The Ibis*, 1901, p. 478) says: "We frequently saw pairs, but they seemed confined to the edge of the forests along the river banks and places where bamboos grew. On the Coca, in June, I saw three of their nests in close proximity, suspended from the tips of bamboos overhanging the water. The bare skin round the eyes is dark slaty-blue. Beautiful as the colour of these birds is in the skin, it is still more beautiful in life. I noticed that our specimens faded as soon as they began to dry, and turned more yellow. The Zapáro Indians called them 'Palandra pisco,' which was not very distinctive, for they applied the same name to other birds. It means Plantain-bird."

That is all I have discovered respecting the wild life. Russ says that the London Zoological Gardens possessed this species in 1865; Emil Linden, one of the best-known German aviculturists, also possessed it, and in 1889 Mangelsdorff brought it home with him from Brazil

BLACK-THROATED HANGNEST (*Icterus gularis*).

Orange-yellow; scapularies black; wings, excepting lesser coverts, black, edged with white; tail, lores, throat extending down to the breast and bill, black; feet dark horn-grey; irides pale yellow. Female yellow; scapularies and tail olive; wings brown with whitish edges; throat black. Hab., "Southern Mexico, Yucatan, British Honduras, and Guatemala." (P. L. Sclater.)

I have not discovered any field notes. Russ says it is one of the rarest species in the German market; nevertheless since 1886 single examples are always being imported by the principal dealers.

BLACK-SPOTTED HANGNEST (*Icterus pectoralis*).

Bright orange-yellow, redder on the head; upper back, scapulars, and wings, with the exception of the lesser and middle coverts, black; outer borders of secondaries white, forming a conspicuous elongated patch; ends of primaries and secondaries edged with white; tail black, the lateral feathers more or less edged at tips with dull ashy; lores, front of cheeks, chin, throat, and middle of chest, black; breast and sides of chest more or less marked with large triangular black spots; under wing-coverts yellow; bill black, base of lower mandible pearl-grey; feet bluish-grey; postocular triangular spot black in the skin, probably pearl-grey in life; irides dark brown. Female similar according to Ridgway, duller, interscapalium varied with olivaceous; no pectoral black spots, according to Sclater; probably smaller and with shorter bill. Hab., "Western Mexico and Guatemala and south to Costa Rica." (P. L. Sclater.)

Mr. C. F. Underwood, in an article on the "Birds of the Volcano of Miravalles" (*The Ibis*, 1896, p. 437), says: "Specimens procured were shot near Bagaces in trees dotting swampy potreros, accompanied by *I. pustulatus*; taken also in Bebedero. Native name 'Chiltote.'" And this is all I have found respecting the wild life.

Russ tells us that in 1893 Miss Hagenbeck imported several specimens of this species for the first time from Mexico, and in December of the same year she forwarded to him a dead male from which he took the description in his book.

BARE-FACED HANGNEST (*Gymnomystax melanicterus*).

Bright yellow; back, wings, tail, bill and feet black. Female similar, but doubtless with shorter bill. Hab., Cayenne and Amazonia.

Dr. Goeldi observes (*The Ibis*, 1897, pp. 365-368): "The splendid yellow-and-black-coloured, Oriole-like Icterid, *Gymnomystax melanicterus*, called "Aritaná" here in Lower Amazonia, is a real ornament of the campos-region of Marajo and Southern Guiana, wherever these districts are traversed by rivers. Damp meadows and muddy shores, alternately covered and uncovered by the tides, are the favourite resorts of this interesting bird of charming appearance. It is of confident demeanour, and fond of human residences, breeding regularly in the immediate vicinity of the fazendas. In its character it reminds me much more of the "Virabostas" (*Molothrus*) than of the genuine Toupials and Cassiques; it frequents cattle settlements, is often engaged on the ground with cattle-dung, and walks about there for quarters of an hour together in the manner of the European Starling. I have been recently told that its range increases with the extension of cattle-breeding, and that it makes its appearance along with cattle in regions where it has not been seen before, *e.g.*, in the Municipio de Mazagão in the north channel of the Amazonian estuary. When flying it calls *wreg-krég*; when in good humour and perched near its nest it emits a song like *ting-ting-wrég-wrég-gri-gri*, and is in a few words, a bird not easily to be overlooked by a visitor to a Marajó cattle settlement, making itself known as well by its appearance as by its voice.

"I have two nests of the 'Aritaná,' both from the island of Marajó. The first is a present from a friend, and was taken in December, 1895, on his extensive cattle-settlements; the second I took myself during a recent journey to the same locality, Cabo Magoary, in August and September, 1896.

"These nests are open and porringer-shaped, similar to those of certain Thrushes, and quite different from the bag-nests of *Ostinops* and *Cassicus*, so far as I know them, and from other constructions of the Icterinæ that we see figured in many ornithological works. The material consists of grass leaves (whole and longitudinally split), slender roots, and fragments of small climbing plants. There is no softer lining.

The second nest, taken by myself at Fazenda Livramento, was situated in the fork of a branch and well hidden in the foliage of the crown of a "mporcegeira" tree (*Andira*, sp. inc.), some 8 or 10 m. above the ground. The tree was distant not more than, perhaps, some thirty steps from the central buildings of the above-mentioned fazenda, in the open farmyard, and in the midst of a considerable and constant crowd of men, horses and cattle. Nevertheless, the "Aritaná" is very circumspect in the vicinity of its breeding-tree, and, when it finds itself observed, does not readily approach. The discovery of this nest was only effected by patiently waiting for some hours in a hidden corner."

Dr. Goeldi says the eggs sent with the first nest arrived broken, and the second nest had young, which were allowed to mature and fly; but from the fragments it is evident that the surface is bluish-white, with large dark irregular spots.

Captain Pam presented an example of this so-called "Hangnest" to the London Zoological Society in 1906.

CHAPTER II.

OLD WORLD STARLINGS (*Sturnidæ*).

These birds undoubtedly are related to the *Icteridæ* and to the Crows (*Corvidæ*). The Hill-Mynahs or Grackles, which in many respects resemble the Crows, have been separated as a distinct family, on account of their possession of rictal bristles, by Mr. E. Oates. Professor Ridgway, however, says ("Birds of North and Middle America," Vol. IV., p. 280) that his diagnosis of the *Sturnidæ* "is identical, almost word for word, with that given for the '*Eulabetidæ*,' . . . . except as to the rictal bristles, which are said to be 'present' in the *Eulabetidæ*, while in the *Sturnidæ* there are 'no rictal bristles nor vestige of any'—certainly a very slight distinction."

In addition to this character, however, as I have pointed out in my little book, "How to Sex Cage-Birds," pp. 76 and 78, the bills of the sexes in the true Starlings are more or less slender and much alike, the slight difference which exists being of the same character as in the Thrushes, the male bill being, when noticeably different from that of the female, slightly longer and more slender, whereas in the true Grackles the bills are broad and heavy, that of the female being considerably narrower, weaker, and rather shorter (though not conspicuously so) than that of the male: I think, therefore, that the family distinction is justified. On the other hand, one might well say of the *Sturnidæ*, as Ridgway does of the *Ploceidæ* (t.c., p. 283), "Whether the single character of possessing one more obvious primary quill than the *Fringillidæ* and *Icteridæ* be considered as sufficient to warrant the separation of the present group as a distinct family is perhaps a matter admitting of difference of opinion." Nevertheless, it is a very convenient distinction.*

The Glossy Starlings of the genus *Calornis* are most nearly related to the *Icteridæ*, inasmuch as they build pensile nests similar in character to many of those of the Cassiques and Hangnests, and lay spotted eggs like the majority of those birds.

Glossy Starlings (*Sub-family Sturninæ*).

SHINING CALORNIS (*Calornis metallica*).

"The general plumage is a mixture of dark rich bronzy green and purple, the green hue predominating on the lower part of the throat and the upper part of the back: wings and tail bluish black, washed on the margins with bronzy green; bill and feet black; irides vermilion" (Gould); female smaller and probably with a slightly shorter bill. Young duller, wings brown, narrowly edged with sordid white; under surface white, streaked on the breast, flanks, and under tail-coverts with blackish. Dr. Finsch, however, doubts whether all the birds with white under surface are young, as they breed in this plumage. Hab., "Northern Australia, New Guinea, and Papuan Islands from the Solomons to the Arn group, as well as the Moluccas."

Gould says ("Handbook to the Birds of Australia," Vol. I., pp. 477, 478), quoting from Macgillivray:—"During the early part of our last sojourn at Cape York, this bird was often seen passing rapidly over the tops of the trees in small flocks of a dozen or more. In their flight they reminded me of the Starlings, and, like them, made a chattering noise while on the wing. One day a native took me to a breeding-place in the centre of a dense scrub, where I found a gigantic cotton-tree standing alone, with its branches literally hung with the pensile nests of the bird: the nests, averaging two feet in length and one in breadth, are of a somewhat oval form, slightly compressed, rounded below and above, tapering to a neck, by the end of which they are suspended; the opening is situated in the centre of the widest part; they are almost entirely composed of portions of the stem and the long tendrils of a climbing-plant (*Cissus*) matted and woven together, and lined with finer pieces of the same, a few leaves (generally strips of *Pandanus* leaf), the hair-like fibres of a palm (*Caryota cereus*), and similar materials: the eggs, usually two, but often three in number, are an inch long by eight-tenths of an inch broad, and of a bluish grey, speckled with reddish pink, chiefly at the larger end; some have scarcely any markings, others a few minute dots only. The note of the bird is short, sharp, and shrill, and resembles '*twee-twee*,' repeated, as if angrily, several times in quick succession." "On the tree above mentioned the nests were about fifty in number, often solitary, but usually three or four together in a cluster—sometimes so closely placed as to touch each other." "The stomachs of those examined contained triturated seeds and other vegetable matter."

This charming bird was exhibited by Mr. Townsend in 1907.

WHITE-BELLIED AMETHYST STARLING (*Pholidauges leucogaster*).

General colour above, violet; many of the feathers on the back with subterminal steel-blue bars; wings, excepting the coverts and inner secondaries, blackish-brown; the outer secondaries edged with violet; the two central tail-feathers violet, with others blackish-brown, with violet outer margins; head, throat, and chest violet, the lores blackish; remainder of under surface pure white; thighs dusky at base of feathers; under wing-coverts and axillaries blackish; bill and feet black; irides yellow. Female above brown, with pale margins to the feathers; inner webs of flights mostly suffused with pale cinnamon; cheeks white, streaked with brown; under surface white, slightly sandy on throat; the hind throat and breast with defined triangular dark brown spots, which become rounder at back of breast and sides of vent and longer on the sides of the abdomen, where there is a brownish wash; under wing-coverts and axillaries brown with reddish edges; quills below rufescent on inner webs. Hab., "Tropical Africa from 17 deg. N. lat. to Gaboon, on the west, and to the equator in Central and Eastern Africa." (Shelley.)

Shelley observes ("Birds of Africa," Vol. V., pp. 39, 40):—"In Liberia, Mr. Büttikofer met with it most frequently in the open country, the females and young birds perching together on the bushes, while the full-plumaged males kept by themselves at some little distance. During my visit to the Gold Coast I met with the species on a few occasions in February, between Accra and Abokobi, always in fairly large flocks of about a score."

According to Ussher and Hartert, this species feeds upon berries and fruit. The nesting habits appear to be unrecorded, but they probably differ little from those of the southern representative of the species *P. verreauxi*, which is said to build in holes in trees, lining some natural hollow, or the old nest-hole of a Barbet, with wool and feathers, over which green leaves are placed and removed from time to time. The eggs usually number four, and are pale blue, sparingly

* By the way, in his notes on the *Ploceidæ*, Ridgway incorrectly says that "terrestrial forms are apparently wanting"; he overlooks the Quail Finch (*Ortygospiza polyzona*), which not only spends nearly its whole existence on the ground, but nests there.

spotted at the larger end with pale brown.* The cries are harsh, with the exception of a pleasing whistle uttered by the male.

I believe Mr. E. Hopkinson secured two males of this lovely Starling, one of which he presented to the London Zoological Society in 1906.

Western Splendid Glossy Starling (*Lamprocolius chrysonotis*).

Above, metallic golden-green; scapulars and middle of back steel-blue, the former with a subterminal black spot; median and greater wing-coverts tipped with blue, and with a subterminal black transverse spot; secondaries similar in colouring, but with a broad belt of black; primaries steel-blue, greenish externally; tail black, purplish towards base, the tip broadly steel-green, washed with blue; lores velvet black; sides of face metallic steel-blue; a triangular spot of coppery bronze behind the ear-coverts on sides of neck; throat violaceous steel-blue; breast reddish-purple, slightly coppery; abdomen and flanks purplish-blue, changing to steel-green on lower flanks, vent, and under tail-coverts; under wing-coverts and axillaries purplish blue; flights below black; bill and feet black; irides pale yellow. Female smaller, with no, or hardly any.

Purple-headed Glossy Starling.
(*Head of male.*)

coppery-reddish on the breast; the triangular spot behind the ear-coverts violet, with scarcely any coppery tint. Hab., Senegambia to Fernando Po.

Captain Shelley places this and the other species of *Lamprocolius* with the long-tailed species under *Lamprotornis;* he refers the name *splendidus* (applied by Dr. Sharpe to this species) to its Eastern representative.

According to Fraser ("Proceedings of the Zoological Society," 1843, p. 52), this species is "very shy, "caws somewhat like a Crow; makes a burring noise like a parrot when beginning to fly; lives in the loftiest trees. The gizzard contained small seeds and red berries."

Without doubt, like its Eastern representative (to which it is very closely related), it nests in holes in trees at from twenty to thirty feet from the ground, using dry grass for the purpose. The eggs of neither species appear to have been described.

Russ says that in 1863 a living specimen reached the Amsterdam Zoological Gardens, and it was also to be seen in the Berlin Gardens; otherwise it appears not to have been imported. Being a common West African species there is not the least reason why it should not be brought home in quantities if there were a demand for it. Russ confounds the Western and Eastern forms, but the former would be the species most likely to be imported.

* According to Ansorge, Fischer's Starling, which is a relative of this bird, seems to build a nest somewhat after the pattern of that of a Weaver-bird, and therefore approaching to some extent to the Icterine type, though not pensile.

Purple-headed Glossy Starling (*Lamprocolius purpureus*).

Shining metallic golden green above, shading into steel blue on nape and back of neck and again on lower back; upper tail-coverts violaceous blue shaded with violet; lesser wing-coverts steel blue; median and greater coverts golden-green with blue reflections and a subterminal black spot; flights golden-green becoming bluish at the extremities and fringed with black; tail steel blue, slightly greenish at sides and tip, the central feathers reddish violaceous; head glossy reddish violet, as well as most of the under surface; sides and flanks less reddish; under tail-coverts deep steel blue; under wing-coverts and axillaries purple; edge of wing blue; flights below blackish; bill and feet black; irides golden yellow. Female not differentiated, but doubtless smaller. Hab., Senegambia to the Niger and through Equatorial Africa to Kavirondo.

Shelley observes ("Birds of Africa," Vol. V., p. 79): "Buckley and I met with them in flocks on the open country which surrounds Accra. . . . Mr. Boyd Alexander found it in large flocks inland near the Volta, and these Starlings have been obtained at many places in Togoland. In Dahomey, according to Mr. F. Newton, it is known to the natives as the 'Ago-he.'" Nothing, however, seems to have been published respecting its wild life. It reached the London Zoological Gardens first in 1856, and those of Amsterdam in 1871; in the London Gardens, according to Russ, it was bred in 1874*; the late Mr. Wiener also had a pair which built a nest in a hollow branch. Mr. von Schlechtendal had one for nine years; when feeding it would let no other birds approach the food or water vessels. This is one of the Glossy Starlings most frequently met with at bird shows.

Green Glossy Starling (*Lamprocolius chalybeus*).

The general colour of this species is a metallic, steely green, especially on the mantle, upper part of back, and shoulders; the lower part of the back, rump, and upper tail-coverts are deep steel-blue, slightly tinted with violet and green; the wing-coverts are coloured like the back, the median and greater coverts with a subterminal velvety-black spot; the inner lesser coverts are deep purple and violet, forming a distinct shoulder-patch; the bastard wing, primary coverts, and quills black, steely-green externally and tinted with blue; secondaries with a terminal velvety-black spot; tail-feathers violet-blue, the outer webs with slight steely-green reflections; crown of the head deep steel-blue, the nape and back of neck shaded with violet; lores velvety black; sides of the face deep steel-blue; the ear coverts and sides of neck suffused with violet; cheeks, throat, front of neck, and breast steely-green, slightly shaded with blue; back of breast, sides, and abdomen purplish blue; flanks, thighs, and under tail-coverts steel-blue; under wing-coverts and axillaries rosy purple; the edge of the wing steel-blue; under side of quills blackish; bill and legs black; iris of eye golden yellow. Hab., North-Eastern Africa and Senegambia.

* I can find no record of the fact in the Proceedings for that year, and one would have expected Captain Shelley to notice such an occurrence as giving some information respecting the nidification. Wiener says: "Young were hatched there in 1871 and 1874."

Captain Shelley regards *L. sycobius*, from Eastern Africa, Mombasa district to the Zambesi and thence to the Western Transvaal, and *L. chloropterus*, West Africa from Senegambia to Gaboon and throughout North-eastern and Eastern Africa to the Zambesi, as mere varieties differing in size, the colouring of the head and lesser wing-coverts and the amount of indentation on the edge of the inner web of the first four long primaries. Russ makes all three distinct species in his book.

Von Heuglin says: "The breeding season occurs in the months of July to September. One often sees six to eight nests on one and the same tree. As breeding sites, Adansonias, *Zizyphus*, *Balanites*, and Acacias are chiefly selected, which stand somewhat isolated. The altitude of the nesting-place varies according to circumstances to from ten to thirty feet. Usually they are constructed of heavy, dry, black scrub; nests proportionately very large are used for several broods. They stand upon the forks of branches, sometimes close to the trunk, but mostly upon weaker branches, and externally resemble small crows' nests; the nesting hollow on the other hand is of small circumference, deep, and neatly lined with dry grass, feathers, wool, etc. I have never found more than three eggs or young in it. The former are thin-shelled, oval, 11-12 lines long, paler or more brightly bluish-green, with isolated blue-grey and violet-brown spots and points."

Captain Shelley says: "The eggs, generally three in number, but sometimes as many as five, are of a pale greenish blue faintly spotted with rufous or violet-grey, and measure, according to Mr. Kuschel, 1.3 by 0.82 on an average. Three eggs, agreeing with Mr. Kuschel's description, were obtained by Erlanger on May 21, 1900, from a nest constructed in the hole of a tree 6ft. from the ground, but a single egg he had taken on April 9th differed in being of a uniform glossy bluish-green, and resembled that of our common Starling. Mr. A. L. Butler, in his notes from the Soudan, writes: "These birds are gregarious throughout the year, breeding in colonies. On the Setit, in April, they were repairing their old nests, which were bulky structures of sticks placed in the tops of 'heglik' trees. Several nests were often built together into one great mass" (Shelley, "Birds of Africa," Vol. V., p. 76).

Herr Wiener says that "the first specimen of this bird was presented to the Zoological Gardens as long ago as 1850, and in 1872 some were bred there. The nest is built in hollow trees or large nest-boxes." Like all the Glossy Starlings, this is a hardy bird; but plenty of insect-food, small worms, and fruit should be given both to this and the allied species in order to keep them in good condition.

According to Dr. Russ the late Mr. Wiener possessed examples both of *L. sycobius* and *L. chloropterus*, so that he appears to have considered them distinct; but I am perfectly satisfied to accept Captain Shelley's decision, which is based upon very extensive experience of African birds, both in the field and in the cabinet.

Nordman's Glossy Starling
(*Lamprocolius chalcurus*).

Very like the preceding, from which it is distinguished by a reddish-violet shade on the tail, best defined towards the basal half of the central feathers; irides orange-yellow. Hab., Senegambia to the district of the Upper White Nile.

No field notes appear to have been published, excepting that Ussher speaks of it as "tolerably common up the Volta, where it is to be observed in small flocks." As a rule one or two examples seem to be secured by collectors, and Captain Shelley concludes that it is apparently rare throughout its range, which, he notes, "is mixed up in that of *L. chalybæus* in West Africa, which looks as if it may be only a variety" (t.c., p. 77).

Russ not only considers *L. chalcurus* distinct, but also separates the synonym *L. porphyrurus*. Of the first he says that it was in the collections of Prince Ferdinand, Messrs. E. von Schlechtendal, and E. Linden, as well as the Berlin Aquarium, where it was bred in 1872. Of *L. porphyrurus*, which he says is smaller and without blue shoulders and tail, and less brilliantly glossed with purplish-violet, he informs us that it was imported in 1870 by the dealer Gudera, of Vienna.

Red-shouldered Glossy Starling
(*Lamprocolius phœnicopterus*).

Glossy golden-green, much bluer on head, neck, body, and tail than on wings; the lower back, rump, and upper tail-coverts steel-blue; sides and back of head and neck, tail, and thighs bluish; inner two-thirds of lesser coverts coppery-bronze varied with lilac and blue; ends of median and greater coverts with subterminal black spots and tipped with steel-green; inner webs of primaries and under surface of flights and tail sooty-black; under wing-coverts purplish, blue-green towards bend of wing; bill and feet black; irides pale to orange-yellow. Female similar, but smaller.

Var. bispecularis.—Smaller, back and wings more steel-green; irides orange. Hab., Africa southward from Guboon and Matabeleland.

Respecting the larger race Stark writes ("Birds of South Africa," Vol. I., pp. 38, 39): "In many districts of Eastern Cape Colony this species of Glossy Starling is very common and well known, being often met with in considerable flocks. It is most numerous in the bush and forest districts, where it finds an abundant supply of small fruits and berries, as well as a variety of seeds and insects. I have frequently seen this Starling catching the winged termites as they issued from the ground. It is a bird of lively habits, frequently taking short flights and returning to its perch, and constantly uttering its loud, mellow notes, varied at intervals with a short song which depends for its merit a good deal on the individual performer, and is not unlike that of the English Starling. Small parties of these Glossy Starlings are often to be seen sitting on the tops of high trees, their metallic green and copper coloured plumage glistening in the sun, and recognisable at a distance by their bright orange-yellow irides. In spring the winter flocks separate into pairs, which distribute themselves through the bush in search of a convenient hole in which to place their nest. Usually they make use of a natural hole or cavity in a tree-trunk, but sometimes take possession of one dug by a Woodpecker after driving away the rightful owners. Not unfrequently they build under the eaves of a barn or house, and Mr. Barratt remarks that on his farm on the Chalumna, British Kaffaria, they "frequented the barns and buildings, continually flying to and fro, like English Starlings." The nest holes are thickly lined with dry grass, feathers, and hair, on which four or five eggs are laid. These are usually somewhat elongated in shape, of a pale bluish-green ground colour, sparingly spotted with pale reddish-brown. They average about 1.10 by 0.80."

Respecting the smaller race, Stark says:—"In its habits this race does not differ from the larger *L. phœnicopterus*," therefore I need not repeat other accounts of its nidification. Captain Horsbrugh presented an example to the London Zoological Society in 1906.

Violet-headed Glossy Starling (*Lamprocolius purpureiceps*).

Above, glossy golden-green; upper tail-coverts black at bases, edged with steel-blue and with a subterminal shade of bronzy purple; wing-coverts steel-blue; flights purplish-black, steel-blue externally; inner secondaries glossed with golden green; tail-feathers blue-black, golden-bronze externally; crown, sides of neck, chin, throat, and front of breast violet; the forehead and sides of head purplish-black; hinder breast, abdomen, sides, and flanks steel-green, slightly glossed with golden; thighs and under tail-coverts black, washed with steel-blue; under wing-coverts and axillaries black, edged with metallic steel-blue; flights below black; bill and feet black; irides yellow. Hab., "Cameroons to the Loango Coast, and eastward to the Upper White Nile." (Shelley.)

Beyond the fact that it is a woodland species, nothing seems to be recorded respecting its wild life. Russ says that it is extremely rarely imported alive, and to his knowledge, apart from several wholesale dealers, it has only been in the collections of Messrs. Wiener and Linden.

Long-tailed Glossy Starling (*Lamprotornis caudatus*).

Above with the mantle and back of a shining peacock green; the lower part of the back, rump, and upper tail-coverts glossy steel-blue and purple, the feathers being spotted towards the tip with velvety black; the scapulars, lesser and median wing-coverts, bastard wing, primary-coverts, and quills shining steely-green, shot with blue, and showing black bars in certain lights; the secondaries bluish towards the tips; tail-feathers rosy purple, with a faint bronze gloss and more or less violet reflections, these also show evanescent black bars; crown of the head metallic bronze, as also the sides of the face and throat, the latter slightly spangled with golden bronze; lower part of throat shading into deep steely-green, with a subterminal blue shade, which merges into peacock-green on the breast; lower part of the breast and abdomen purple, glossed with copper; sides of body glossed with blue; thighs blue with a violet shade; under wing-coverts and axillaries steely-green, slightly bluish; quills below black; bill and legs black; iris of eye sulphur-yellow. This seems a large bird, measuring upwards of 19 in. from the tip of the bill to the extremity of the tail, but the latter occupies 13½ in. of the total length. The female is probably a trifle smaller. Hab., "Northern Tropical Africa, from Senegal to the Niger, and eastward into Abyssinia" (Shelley).

Long-tailed Starling.

A bluer form, *L. eytoni* Fraser, which Dr. Russ regards as distinct, has not been recorded farther east than Fantee. Capt. Shelley says of it, "I doubt *L. eytoni* being even a good sub-species, as it is known only from the districts inhabited by *L. caudatus*, and as yet we know little with regard to the moult of these species."

According to Von Heuglin this bird moults in November and December, and breeds about August. It lives in pairs and families of about six to eight individuals, which are making a noise and in motion the whole day, sweeping about far into the lofty forest or scrub. One frequently observes the young, sitting huddled together upon a slender branch, whilst the adults dart busily from branch to branch, scuffling together or with other birds, or with lifted tails like Magpies run and hop hither and thither upon the earth.

The food, according to Von Heuglin, consists principally of fruits and buds, yet they also seize all kinds of insects, which are often most cleverly snapped up during flight.

In Shelley's "Birds of Africa," Vol. V., pp. 55, 56, we read:—"Mr. Boyd Alexander writes:—"It frequents the open bush-country, nesting in holes in the big baobab trees."

"The eggs have been described by Mr. Kuschel as glossy greenish-blue, 1.06 by 0.81, and by Mr. Nehrkern as deep blue, with evenly-distributed dots of pale brown, and measuring 1.12 by 0.8."

The movements of the species on the wing are rapid and graceful, as anyone who had seen the specimens in the late Mr. Abrahams' aviary would at once admit. I was much amused by a little experiment which we tried to prove their intelligence. My friend informed me that whenever he entered their room these Starlings expected a mealworm, and if he went out, forgetting to humour them, they were certain to remind him. We then went outside and shut the door, and immediately there was a chorus of harsh shrieks. The only drawbacks to the pleasure of keeping these birds are the necessity for devoting a spacious aviary to them in order to exhibit them to advantage, and the noise which they are apt to make when they want anything. At other times, so far as I could judge, they appeared to be exceptionally quiet. Like the other glossy Starlings, fruit and insects form the natural diet of this species; in the aviary egg-food, boiled potatoes, and small worms may be safely added.

This is a familiar exhibition-bird; it first appeared at the Amsterdam Zoological Gardens in 1864 and the London Gardens in 1866.

Purple-backed Glossy Starling (*Lamprotornis purpuropterus*).*

Smaller than the preceding species; above glossy green, the hind-neck and upper back shaded with reddish-violet; the lower back and upper tail-coverts of that colour; tail violaceous blue, both upper tail-coverts and central tail feathers with darker bars; wings green or violet; head glossy bronze; chin and upper throat edged with violet and blue which shades into green on the lower throat; centre of chest coppery bronze shading into violet on the remainder of the breast, thighs, and under tail-coverts; wings and tail below brownish-black; under wing-coverts washed with bluish-green; bill and feet black; irides straw-yellow.

* I cannot see any reason for the adoption of the later name *porphyropterus* for this species; it is neither adopted by Russ nor Shelley, and therefore I do not here follow the Museum Catalogue.

Female similar, but smaller. Hab., Eastern Africa and the Lake district from about 6 deg. S. lat. to 9 deg. N. lat. (Shelley.)

I quote the following field notes from Shelley's "Birds of Africa," Vol. V., pp. 57-59:—"Mr. Jackson found the species in the Suk country, and writes: 'Plentiful in small flocks; song very sweet.' At Elgeyu, in the middle of August, they were 'very plentiful; breeding. They make a shallow nest of sticks, mostly thorny, very rough.' He also met with them at Kinani, and on the Samia Hills in Kavirondo, in parties of three to five individuals." "The egg, according to Mr. Nehrkorn, is uniform sky-blue, and measures 1.14 by 0.84."

"Heuglin met with the species in Sennar and Kordofan, and records it as plentiful in the mountains of Northern Abyssinia up to 6,000 feet, living in small parties, mostly frequenting the higher trees and occasionally the pasture lands, and he not unfrequently saw them perched on carcases, probably searching for maggots, for, like the Starlings generally, their food consists of all kinds of fruit and insects. They breed in July and August, and construct a large nest in some tall tree. The eggs are compared by Heuglin to those of our Blackbird."

"Mr. Witherby writes (*The Ibis*, 1901, p. 249):—'These birds were plentiful as far as we went south of Duem, but we did not observe them more than ten miles north of that place. Their song is sweet, but they have a perpetual and irritating call-note which is decidedly harsh. We found them in small companies, generally frequenting the tops of the trees; they were very tame.'"

Russ says: "This Glossy Starling with us is excessively rare in the market and its price stands at from 45 to 60 marks. It was present in the Berlin Zoological Gardens and the Berlin Aquarium."

Meves' Long-tailed Glossy Starling. (*Lamprotornis mevesi*).

Much smaller than *L. caudatus*, the lower back and rump more glossed with reddish-violet; head and throat steel-blue with a purple gloss; scapulars and wing-coverts without subterminal black spots; bill and feet black; irides brown. Female with the first half of crown and the throat more green than blue; back of crown with a slight violet shade; lower back and breast more lilac with scarcely a tinge of copper. (Shelley.) Hab., Southern Tropical Africa, from Mossamedes to Damaraland on the west, and Limpopo to Nyassaland on the east; represented in Benguela by a subspecies, *L. purpureus* Bocage (*benguelensis*, Shelley). Shelley says he was obliged to rename *L. purpureus* because he can find no character by which to distinguish *Lamprotornis* and *Lamprocolius*; there is at least the long tail of the former, which, if not a very important character, conveniently serves to distinguish them.

I quote the following short account of the habits from Shelley's "Birds of Africa," Vol V., p. 61:—"From the Zambesi Mr. Boyd Alexander writes: 'Found in small parties on the low ground overgrown with brushwood, skirting the hills. By the middle of October these parties had split up into pairs and were then about the only birds to be seen during the heat of the day in the mealie-fields, preying upon insects. The alarm note is a harsh screech. I take the following observation from my note-book:—"While I write, three Long-tailed Starlings are sporting themselves on the bare, dried-up ground close to my tent, busy picking up small grasshoppers. Their behaviour and gait remind me of our Blackbird—first a violent rush forward, then a sudden dip of the head to pick up some morsel, and then on again, the whole time their tail being jerked up and down."'"

According to Russ the typical form has once been exhibited in the Amsterdam Zoological Gardens, and the subspecies has formed part of the collections of Messrs. Wiener and Linden.

Wedge-tailed Glossy Starling (*Heteropsar acuticaudus*).

Glossy green; the rump and upper tail-coverts with slight blue reflections; inner lesser and median coverts coppery-red becoming bluish at the edges; median and greater coverts with subterminal black spots; flights blackish glossed with green or blue externally; tail greenish-blue; lores black; ear-coverts deep steel-blue; sides, flanks, and thighs, steel-blue; under wing-coverts and axillaries blackish with steel-blue edges; edge of wing greener; flights below blackish, browner along inner edges; bill and feet black; irides orange-yellow. Female smaller. Hab., Angola to Ovampoland.

Beyond the fact that it feeds principally upon fruit and is known at Luilla as "Eiabairo," at Galanga as "Jabairo," and on the Lehe River as "Mucombe," nothing appears to be recorded respecting it in a state of freedom.

Russ says: "Many years ago this species was represented in the Berlin Aquarium."

Beautiful Spreo (*Spreo pulcher*).

Above glossy green, bluer on the tail; flights blackish, metallic green externally; inner webs of primaries mostly creamy white; head all round bronzy-brown; lores black; throat and fore-breast glossy green; remainder of under surface cinnamon; edge of wing below green; flights below dusky brown at tips, otherwise creamy white; bill and feet blackish; irides pale yellow. Female rather smaller. Hab., N.E. Africa, extending to the Niger district and Senegambia. (Sharpe.)

According to Heuglin, this is the most abundant of the Glossy Starlings. "It inhabits the open country below 600ft., where it is to be seen in small flocks. It breeds in September and October, when scarcely a bush, on some of the plateaux, is without a nest of this Starling. The nest is large, constructed externally of twigs, lined with straw and soft materials, and contains three or four eggs, which are clear greenish blue, with violet or brownish red spots, largest and most numerous towards the thick end, and measure about 1.05 by 0.72."

"Mr. Witherby (*The Ibis*, 1901, p. 249) met with the species some fifty miles south of Khartoum and remarks that it is shy and artful, keeping one of the party on watch from a topmost bough. 'Just as you arrive within gunshot the sentinel gives a warning whistle, so shrill that it sounds almost like a squeak, at which all the flock take a short, straight flight to another tree. When feeding on the ground this species is more easily approached, and its gait and action are similar to those of our Starlings.'" (Shelley, "Birds of Africa," Vol. V., pp. 94, 95.)

Russ observes that it is extremely rare in the German market. The collections of the Paris and London Zoological Gardens have possessed it.

GREEN GLOSSY STARLINGS.

Typical Starlings.

UNSPOTTED STARLING (*Sturnus unicolor*).

Uniform glossy black with purple reflections; wings and tail blackish-brown; inner primaries and secondaries paler towards the tips, and fringed with black; bill yellow; feet pale brown; irides dark brown. Female rather duller, and with a shorter wing. Hab., the countries of the Mediterranean.

J. L. S. Whitaker observes ("Birds of Tunisia," Vol. II., pp. 4, 5):—"*S. unicolor* is to be met with, as a rule, in small colonies in the neighbourhood of cliffs and rocky, broken country, which afford suitable shelter and convenient nesting places for the birds. Near Kasrin the character of the country is eminently adapted to this Starling's requirements, and many of the birds consequently breed there. The nests are placed in the holes and crevices of the cliffs, and are loosely constructed of dry grasses or straw, with a lining of feathers. The eggs, of which the usual complement is four to six, are indistinguishable from those of the common Starling, being generally considerably elongated in shape and of a uniform glossy pale blue-green colour. Measurements, 29 by 21 mm.

"Like *S. vulgaris*, the present species is very noisy and a great chatterer, particularly during the breeding season, and, like its relative, whistles not unpleasantly. The diet of this, like that of other Starlings, consists mainly of worms, grubs, and insects of different kinds, but there is no doubt these birds occasionally feed on grain, berries, and other vegetable matter, and they may, indeed, be considered omnivorous, as they also devour eggs, and at times even young birds."

Russ says that this bird arrives in the market extremely rarely and hardly ever gets into the hands of aviculturists: it reached the Amsterdam Zoological Gardens in 1866, has on several occasions been exhibited in our London Gardens, and one example reached the Berlin Gardens, about 1897 apparently.

Starling-like Mynahs.

GREY STARLING (*Poliopsar cineraceus*).

Above greyish drab, the edges of the feathers brown; rump white; upper tail-coverts greyish, the base of the feathers dark brown; median and greater coverts dark brown, bronzy olivaceous towards the tips; remaining wing-feathers blackish; primaries with narrow whity-brown fringes; outer secondaries with white edges, inner ones bronzy olivaceous like the greater coverts; central tail-feathers bronze-brown; the remainder black, slightly greenish on outer webs and edged with whitish; crown greenish black; forehead whitish, continued in a line over eyes; sides of head white or whitish streaked with blackish; chin white; hinder part of cheeks, throat, sides of neck and breast dark slate-grey, paler on sides of breast; centre of breast and abdomen and under tail-coverts white; sides, flanks, and thighs drab; under wing-coverts and axillaries white, the former partly edged with blackish; flights below dusky with ashy inner edges; bill reddish-orange, the tip blackish; feet ochre-yellow; irides brown, circled with white (or white, according to R. Swinhoe). Female rather browner, throat and breast brown with central whitish streaks. Hab., E. Siberia to Japan; throughout China and Formosa, extending into Upper Burma (Sharpe).

According to Blakiston and Pryer (*The Ibis*, 1878, p. 233) this species breeds in holes in fir-trees. Seebohm says the eggs resemble rather small and dark eggs of the European Starling.

According to Mr. Walter Goodfellow (cf. *The Ibis*, 1907, p. 160), "the Grey Starling winters on the plains" in Formosa.

David and Oustalet say:—"The Grey Starling is certainly that species of Starling which one finds most abundant in China. In autumn and winter it ranges in countless flocks over the entire kingdom, and the sweet husks of the Sophora japonica afford it abundant food. Great numbers of these Starlings remain in the plains of Pekin, and build their nests in holes in trees; but in summer they all disappear, to spend the remainder of the warm season on the high plateaux of Mongolia, where they live upon insects, and especially grasshoppers. The chattering of this Starling is very pleasing, and may be heard in good weather even in the middle of winter" (cf. Russ, "Die Fremdländischen Stubenvögel, Vol. II., p. 484).

According to Mrs. Dörries, the nest, in Siberia, is formed of dry stalks, and lined with grouse-feathers, in a hole in a tree naturally; five to seven eggs form a clutch.

Russ says this may be accounted one of the rarest to appear in the bird market, and he only includes it for the sake of making his work complete; yet it seems to me that the commonest Starling in China is a bird extremely likely to be freely imported at some time or other.

SILKY STARLING (*Poliopsar sericeus*).

Pale ash-grey, a little darker on back of neck, a little paler on rump and upper tail-coverts, which have whitish margins; scapulars externally white, with a subterminal black shade; lesser wing-coverts blackish edged with slate-grey; median coverts purplish black; greater coverts black, glossy green externally; primary-coverts white, the tips black near the centre; primaries white at base, otherwise black, externally glossed purple; secondaries like the greater coverts, but bluish or purple towards the tips; central tail-feathers glossy green; the others black with green or purple suffusion externally; head all round white; breast, sides and flanks ash-grey tinged with brown; thighs white in front; under tail-coverts, under wing-coverts, and axillaries white; flights below dusky, greyish on inner edge, white at base; bill bright red, white tipped; feet orange; irides black. Female browner, more ashy on rump; the gloss on wings and tail less marked; primary-coverts blackish-brown near base, white with central black streak at tips; head less white, sides of crown, hind neck and cheeks ashy; under surface of body light brown where grey in the male; possibly immature (Sharpe.) Hab., Central and South China.

I can discover nothing about the wild life, but it is probably very similar to that of the preceding species. Russ has omitted it, so that he evidently did not think it necessary to the completion of his work; yet it has been purchased and exhibited in the London Zoological Gardens in 1883, 1890, and 1891 (five specimens), and therefore can hardly be one of the rarest birds to appear in the market.

ANDAMAN STARLING (*Poliopsar andamanensis*).

Above ashy-grey, whiter on the rump; scapulars edged with white; wings black; the lesser-coverts edged with slate-grey; flights glossy greenish externally; tail black, glossed with green, all the feathers excepting the central ones with a white marking, increasing in size outwardly, at end of inner web, the outermost being half white; head and neck all round and under surface white; vent and under tail-coverts tinted with fawn; flights below dusky with ashy inner

web; bill and feet bright waxy yellow; base of lower mandible and tomium bluish-slate; irides pearl blue, with bluish naked orbital ring. Female smaller and with shorter wing. Hab., Andaman and Nicobar Islands.

I have not discovered any field-notes on this species, but it is now a well-known show bird. Russ says that the dealer G. Reitz, of Berlin, sent him three specimens in 1891, and during the same year several specimens reached the Berlin Zoological Gardens. He overlooks the fact that the London Gardens purchased a specimen in January, 1885.

Malabar Mynah (*Poliopsar malabaricus*).

The cock in breeding plumage is a soberly coloured bird, its prevailing colour above being ash-grey, suffused with rosy brown, with which colour the feathers are edged; the lower part of the back, rump, and upper tail-coverts slightly more ashy than the remainder of the back; the wing-coverts blackish, ashy externally; the bastard wing, primary-coverts, and quills black, broadly tipped with ashy and edged externally with purplish black; the secondaries are also tipped with ash colour, the inner ones being entirely of that colour; central tail feathers ashy-blackish, edged with ashy and tipped with chestnut, the coloured tip widening towards the outermost feathers; head and neck rufous-brown, the feathers with ashy centres; lores and sides of face rufous-brown; ear-coverts dingy ash-coloured; cheeks, chin, and throat pale ash-coloured, with reddish edges to the feathers; front of neck reddish-brown, streaked with ash colour, the remainder of the under surface deep cinnamon; thighs ashy; under tail-coverts cinnamon, the longer ones white; under wing-coverts and axillaries ashy, with a faint reddish tinge, those towards the base of the primaries whitish; quills below dusky brown, with pale inner edge; bill blue at the base, green in the centre, and yellow at the tip; legs brownish olive; iris of eye greyish white. The hen is paler than the cock, its legs are dusky yellow, and its iris is white; otherwise it is very similar. Hab., India, Burma, and Cochin-China.

In its native country, according to A. O. Hume, this Starling, which is also known by the name of the "Grey-headed Mynah," appears to prefer country which has been partly cleared, especially low but breezy ridges, at elevations of from 2,500 to 4,000 ft., where only a few trees have been left standing here and there. It feeds about equally on trees and on the ground; it is very fond of the fruit of the peepul tree. It may be seen in flocks of from forty to fifty individuals. Like other Starlings, this bird nests in natural holes in dead or living trees; but if the hole is not large enough for its purpose it widens it. It chooses, in preference to others, a hole difficult of access, at a height of from 20 ft. to 50 ft. from the ground, and in the bottom of the hole constructs a rough, loose pad of fine twigs, mingled with long strips of bark, straw, grass-stems or roots, or leaves only. The central depression is only about ½ in. deep, and in this three to four pale blue or delicate sea-green eggs are deposited. The time of nidification is from May to June. Herr Wiener successfully reared this species in confinement, a cigar nest-box being selected. He says: "I followed the plan of never giving much food at a time and making the birds work for it. Their food-dish (containing egg, breadcrumbs, German paste, and ants' eggs) I partly covered with a thin layer of garden mould, and thus taught them to dig out the richer bits. One hour I gave them a few mealworms; another some spiders, or little morsels of raw beef, or a handful of live ants, mould, and larvæ—and so on, until the young birds were able to take care of themselves." This is by far the most lively Starling that I have kept, and, though incessantly on the move, was always in perfect plumage; but eventually I exchanged it for something which I was more interested in at the time. Mr. Farrar bred the species later, and had the bad taste to call in question Mr. Wiener's statement respecting the food supplied to his birds, and as good as said that he did not believe it; he concluded this exceedingly courteous article by sneering at a remark of mine respecting a bird exhibited at the Palace, and asking whether I had ever kept one. It is quite possible that my male may have been one of those which subsequently came into Mr. Farrar's possession. At the time

Andaman Starling.

when I bought it, there were others in the market, and consequently it only cost me ten shillings. Oddly enough, Dr. Russ speaks of it as "a most delightful bird, unfortunately rare in the trade, only scattered here and there in zoological gardens and the largest private collections," yet he gives the price in Germany as twenty to thirty shillings a pair; not a very high price for so "rare" a bird, one would think.

Blyth's Starling (*Poliopsar blythii*).

Above pearl grey; greater coverts paler, whitish externally; larger wing-feathers black, greenish externally; primaries at tips and secondaries externally pale grey, the innermost secondaries being almost wholly grey; central tail-feathers pale grey; the next pair blackish tipped with chestnut, and grey externally, the others with the tips increasingly chestnut; head all round, shafts of feathers at back of neck, throat, and breast white; the top of head slightly tinted with pink; remaining under-parts reddish-cinnamon; thighs, under wing-coverts, and axillaries more or less ashy; flights below dusky; bill blue at base, green in centre, and yellow at tip; feet yellow; irides greyish-white. Female smaller, paler, and duller; upper surface more or less ferruginous, especially on rump and upper tail-coverts; head greyer; culmen of bill brownish; feet olive-yellow; irides grey. Hab., Southern India.

Jerdon observes ("Birds of India," Vol. II., p. 332): "This pretty "Myna is only found in the Malabar forests, both near the level of the sea and up to a level of 2,000 feet or so in the Wynaad and the slopes of the Ghats. It is found from the extreme south of the Malabar coast to about north lat. 15 deg. or 16 deg. It is entirely arboreal, living in small flocks, and keeping to the tops of high trees, feeding on various insects and larvæ, small shells (Bulimi), and occasionally on fruit. Its usual cry is neither so loud nor so harsh as that of the Mynas in general, and it has a very pleasing song. Its nails are well curved, and it climbs about the trunk and branches of trees with great facility. It is said to nidificate in holes of trees."

Mr. Iver Macpherson (Hume's "Nests and Eggs of Indian Birds," second edition, Vol. I., p. 371) says: "The only nest I have ever found was taken on April 24th, 1880, and was in a hole of a dry standing tree in a clearing made for a teak plantation, and contained three fresh eggs.

"A few days subsequently I saw a brood of young ones flying about a dry tree in the forest, so probably the breeding season here extends through April and May."

Mr. Hume says: "The eggs are very similar to those of *Sturnia malabarica* and *S. nemoricola*, but perhaps slightly larger. They are moderately elongated ovals, generally decidedly pointed towards the small end. The shell is very fine and smooth, and has a fair amount of gloss. In colour they are a very delicate pale greenish-blue. They measure 0.99 and 1 in length by 0.71 in breadth."

Dr. Russ omits this species from his work, but it has been exhibited at the London Zoological Gardens.

Pied Mynah (*Sturnopastor contra*).

Above, blackish-brown; scapulars white externally; rump white; upper tail-coverts blackish-brown; lesser wing-coverts white; median and greater coverts with greenish margins; tips of primaries edged with white; secondaries more bronze-brown; tail black, fringed at tip with white; crown, nape, and back of neck greenish-black; feathers of forehead and eyebrow tipped with white; lores, eyelid, sides of face, and ear-coverts white; cheeks black; throat, sides of neck, and chin greenish-black; sides of upper neck streaked with white or drab; some of the feathers of mantle drab externally; under surface pale vinaceous grey, more buffish on abdomen; thighs blackish externally, internally white; under tail-coverts, under wing-coverts, and axillaries white; flights below blackish, fringed with white internally; bill red at base, yellow at tip; feet yellowish; irides brown; naked orbital skin orange-yellow. Female smaller than male.

Jerdon says ("Birds of India," Vol. II., p. 324):—"The Pied Starling is more abundant in the Northern Circars than anywhere else where I have seen it. It here associates in vast flocks of many hundreds, feeding among cattle. In general it is only found in small parties. It feeds, like the others, on grain, fruit, and insects. It is a familiar bird, feeding close to houses, and breeding on trees near houses—sometimes, as at Sangor, in the midst of the town; though, as Mr. Blyth says, 'It does not venture into the streets in Calcutta.' It makes a large nest of sticks, grasses, and feathers, usually about eight or ten feet from the ground, and lays three or four eggs of a clear greenish-blue. It breeds from April to June or July, according to the locality. It is very often taken young, and caged; has a pleasant song, and is a great imitator of other birds."

This handsome Starling reached the London Zoological Gardens in 1871; in 1875 the dealer Karl Gudera received several specimens. According to Schlechtendal, his example did not live exactly at peace with its associates, "but is not spiteful if they leave it alone, but if another bird repeatedly comes unpleasantly close, he stretches his long bill far up to keep it away, and exhibits an extremely extraordinary aspect. When he is anxious or distressed one hears him utter clear whistled notes. Finally, the Pied Starling is a musical bird, and its song is altogether the best Starling song that I know of."

Jalla Mynah (*Sturnopastor jalla*).

Differs from the preceding in the absence of white streaks from the forehead, the yellow orbital naked patch extended backwards to above the middle of the ear-coverts; irides pale yellow. Female smaller and browner. Hab., Sumatra, Java, Bali, Madura, (Sharpe.)

According to Dr. H. A. Bernstein, this is "one of the most widely-distributed and commonest birds in Java, and can be found everywhere, excepting in the higher mountains and extensive primeval forests; where men have settled, the land has been built upon, and there are larger or smaller pastures grown with short grass in the neighbourhood; we see it most abundant upon freshly-enclosed fields and garden plots, where it is so little shy that it often comes quite close to the workers. While, however, it shows its close agreement with allied species of Starlings in regard to the choice of its residence, and also in its manner of life, it differs in that it much more rarely, and never so constantly, remains in the immediate vicinity of grazing herds of cattle. On the contrary, it regularly visits ploughed fields, gardens, meadows, and pastures in order to seek its food, consisting of worms, insects, and their larvæ, either upon the freshly-turned earth or between the short grass. As these are for the most part injurious to agriculture, or are creatures hurtful to beasts or men, one must regard it as belonging to the group of the most useful birds. Also it searches in the excrement of men and beasts for maggots, etc. If not

busy seeking for food, it sits contentedly upon lofty trees, and thus one sometimes sees it in the morning, in numbers, on the palms. During the midday heat, however, it frequently conceals itself in the dense foliage of the tree-top. In the construction of its nest it deviates greatly from the allied birds. It is no true breeder in holes, but, according to my observations, likes best to place its nest in the interstices of the frond-stalks of the palms. I myself have mostly found it upon pinary palms (*Areca catechu*, L.). As a rule, it is of considerable bulk, and, owing to its position between two gradually diverging palm-frond stalks, it has an elongated appearance, becoming narrower behind. One might liken it to a cone lying obliquely, at the base of which only the flat entrance sufficing for the bird is situated. As building-material these birds utilise exclusively grass and rice-stalks, which, especially at the outer sides of the nest, are bound together roughly and untidily, and the entire structure is by no means compact, having a dishevelled aspect, so that at first sight one might take it rather for a bundle of straw or hay than for a bird's nest. The number of eggs consists usually of four, rarely five, at times only three. They are pale greenish blue, yet always smaller than those of the allied species (length 27 mm., diameter 20-21 mm.). Eggs and young have dangerous enemies in Crows and Ravens living there."

Dr. Russ says that it is so seldom imported alive in Germany that it must be regarded as one of the rarest birds in the trade. It is even wanting in the list of birds in the London Zoological Gardens. Yet a bird so abundant in Java may be imported in numbers at any time, and having already been brought home, it cannot be ignored.

Wattled Starling (*Dilophus carunculatus*).

Pale drab; rump and upper tail-coverts whiter; wing-coverts lighter, primary-coverts, flights and tail black; head, face, and throat naked, bright yellow; two erect fleshy wattles on the crown and a pendant lappet in the centre of the throat black; bill yellow; feet flesh-colour; irides brown. Female browner, rendering the white on the rump more conspicuous; upper tail-coverts brown; wings browner than in the male; head feathered like the back; lores dusky; sides of face and under-parts more buffish, whiter at centre of abdomen; region of eyes and a patch behind bare and yellow, as well as the sides of the throat. Hab., "Africa generally, excepting the forest region of the west coast; Southern Arabia." (Sharpe.)

Stark observes ("Birds of South Africa," Vol. I., pp. 24-25): "The well-known 'Locust Bird' is of gipsy-like habits, migrating here and there without much regard to season, and frequently appearing suddenly in a district for several days or weeks in flocks numbering tens of thousands, to disappear as suddenly, often for many years. These Starlings are, in fact, so largely dependent for food upon the migrating swarms of locusts that they are compelled to remain in touch with these insects for the greater portion of the year. A few stray individuals occasionally remain for a time after the larger flocks have taken their departure, and find an asylum in the ranks of the resident Red-winged or Brown and White Starlings, with both of which species they are on amicable terms. In September, 1869, Layard found these Locust Birds breeding in vast numbers on the Berg river, about eighty miles from Cape Town, their nests filling many bushes, but they do not appear to have visited this district since that date. In the same year they bred near Bedford.

"When pursuing a flight of mature locusts these Starlings perform various extraordinary and beautiful aerial evolutions with the object of intercepting and surrounding a portion of the swarm, and in doing this their movements closely resemble those of another locust-destroying Starling, the beautiful Rose-coloured Pastor of Eastern Europe and Asia. Individually the two species are very different, collectively and under similar conditions their actions are quite similar. Starting in a dense 'ball-like' mass, they suddenly open out into a fan-shaped formation, then assume a semi-circular arrangement, and finally end by forming a hollow cylinder in which a portion of the locusts are enclosed; as the imprisoned insects are destroyed, the Starlings gradually fill up the hollow of the cylinder until they again assume their 'ball' formation and proceed to follow the remaining locusts. The ground below the flock is covered with the droppings of the birds and the snipped-off legs and wings of locusts. At other times the Starlings station themselves on the tops of bushes and trees, from which they dart on the flying insects like Flycatchers. When feeding on the ground, on the young locusts, they advance in long lines, three or four deep, the rearmost birds constantly jumping over those in front of them, like English Starlings. When locusts are not to be had the Wattled Starlings will eat almost any variety of insect food, but seem to prefer grasshoppers and small beetles; occasionally they feed upon berries and seeds."

"In Cape Colony the Locust Birds usually breed in very large colonies, in localities in which the locusts have deposited their eggs. For hundreds of yards every thorny bush is packed full of cup-shaped nests, even the spaces between the nests being often filled up with sticks or rubbish, through which narrow passages are left for the ingress and egress of the birds. Many Starlings that can find no room in the bushes build on the ground, or under stones, or in holes, and these unfortunates, together with their eggs or young, ultimately become the victims of the smaller carnivorous mammals or of snakes. It frequently happens also that either the young locusts are hatched in insufficient numbers or that they migrate before the young Starlings are fledged. In either case large numbers of birds perish of hunger, the majority of the old birds and the more advanced young following the locusts. Four or five eggs are laid, usually in August or September; these are of a very pale blue colour, sometimes with a few specks of black at the larger end, but usually unspotted. They are rather pyriform in shape, and average 1.20 by 0.90."

Russ speaks of this as one of the rarest of imported birds, and regrets that he has no knowledge of its behaviour in cage and aviary. Up to 1885 the London Zoological Gardens had exhibited half a dozen examples; it had also been exhibited in the Berlin Gardens, and was a species with which the late Mr. J. Abrahams was familiar; I should therefore not be inclined to support Dr. Russ's view of its extreme rarity.

Dr. Russ includes the Rose-coloured Pastor among the foreign Starlings, but it would certainly have to be included in any work on British birds, as it has occurred in almost every county; it has even nested in Italy. Therefore if I were to include *Pastor roseus* I should have, to be consistent, to include the greater part of the European avifauna.

Mandarin Mynah (*Sturnia sinensis*).

Above ash-grey, somewhat more buffish on lower back; rump and upper tail-coverts creamy-buff; scapulars buffish-white; lesser and median wing-coverts white; greater coverts creamy-buff; remaining wing-

feathers black, externally glossed with green or purple; inner secondaries wholly green; tail black glossed with green, the tips increasingly buff from centre to outermost feather; crown creamy-buff, greyish on nape and back of neck; sides of head, chin, and throat buff, deeper in front, paler behind; sides and front of neck and breast pearl-grey, a few paler feathers on back of throat; abdomen greyish-white; sides and flanks tawny, paler behind; thighs and under tail-coverts creamy-buff; wing-coverts and axillaries pale salmon, white at base; flights below blackish, ashy on inner edge; bill blue tipped with yellow; feet fleshy-grey; irides white (Oates), black (David), pearl-grey (Russ), who also says the bill is grey-green and the feet horn-yellow. Female not differentiated. Hab., "China, Formosa, and Hainan, wintering in South China and extending to Siam, Cochin China, Pegu, and even to Malacca." (Sharpe.)

According to David and Oustalet this species arrives in the South of China in the summer in multitudinous flocks, and always seeks the vicinity of human dwellings. It builds its nest in holes in the roofs.

Mr. J. D. de la Touche (*The Ibis*, 1892, p. 429) says: "Comes to Foochow and Swatow in the spring, and nests under the roofs of houses. I once noticed a flock in the mangroves near Swatow at the beginning of February."

Mr. J. C. Kershaw (*The Ibis*, 1904, p. 238), in an article on the birds of the Quantung Coast, says: "A very common spring visitor, staying to breed, and leaving about the end of September."

Messrs. La Touche and Rickett, on "The Nesting of Birds in Fohkien" (*The Ibis*, 1905, p. 39), say: "Also a summer visitor, and breeding in the native city. We have never, however, obtained its eggs. Some collected by La Touche at Swatow (where, as well as in Hongkong, it nests in foreign-built houses) were very pale blue in colour."

Russ says this is one of the rarest birds in the market, and has hitherto only been in the Berlin Aquarium and the Amsterdam Zoological Gardens; as a very abundant Chinese bird it is very likely to come into the market at any time.

Pagoda Starling (*Temenuchus pagodarum*).

Above pearl-grey; wings, except coverts, blackish, edged with white near the shoulder; secondaries more or less grey; tail dusky grey-black, tipped with whitish; crown and crest greenish-black; ear-coverts and sides of head buff with paler streaks; under surface cinnamon-buff; bill slate-blue at base, greenish in centre, yellow at tip; feet bright yellow; irides greenish-white. Female similar, but smaller, and with shorter crest. Hab., Afghanistan, India generally, and Ceylon.

Jerdon says ("Birds of India," Vol. II., p. 330):—"At Madras it feeds chiefly on the ground, among cattle, in company with *Acridotheres tristis*, picking up grasshoppers and other insects. It also feeds on trees on various fruits, berries, and flower-buds, and occasionally insects. Adams says that in Cashmere it feeds on the seeds and buds of pines. When the silk cotton tree comes into bloom, is always to be found feeding on the insects that harbour in the flowers. I observed this at Jalna, and Blyth remarked the same at Calcutta. At Madras, it breeds about large buildings, pagodas, houses, etc., and lays three or four greenish blue eggs. Mr. Philipps records it as building in holes of trees. It has a variety of calls, and a rather pleasant song. It is frequently caged and domesticated, is docile and hardy, and will imitate any other bird placed near it. Like the others of its tribe, it is lively in its manners and actions, and has a steady, swift flight."

Russ says:—"The Pagoda-Starling reached the Zoological Gardens of Amsterdam in the year 1853. Then Messrs. A. F. Wiener, E. von Schlechtendal and Prince Ferdinand of Bulgaria had it in their collections, and here and there it has continually been advertised by the wholesale dealers." It is, of course, a well-known show bird; a specimen was purchased by our Zoological Society in 1893, and in September, 1901, Mr. Farrar recorded his success in breeding the species in an outdoor aviary; the nest was formed of small sticks in a box; the cock and hen incubated alternately about thirteen days; three young were reared. The eggs are described as "small and blue like a Starling's."

Black-necked Mynah (*Graculipica nigricollis*).

Above brown, the feathers broadly but indistinctly greyish on the borders; rump white; lesser wing-coverts dark brown with white edges; median and greater coverts tipped with white; primary-coverts white; flights and tail-feathers dark brown with white tips, those of the latter broad excepting on the two central feathers; head all round white; hind neck black, followed by a narrower grey-whitish band; sides and back of throat black, the feathers of the latter with grey-whitish tips; rest of body below white; thighs blackish externally; under wing-coverts and axillaries black tipped with white; edge of wing white; bill red-brown; feet yellowish; bare orbital patch bright yellow (David); bill black; feet pale silver grey; iris dark greenish brown; naked orbital patch pale greenish yellow (Russ). The female is noticeably smaller, but similarly coloured.

Hume ("Nests and Eggs of Indian Birds," Second Edition, Vol. I., p. 377) says:—"All that we know of the nidification of this species is contained in the following brief note by Dr. John Anderson:—'It has much the same habits as *Sturnopastor contra* var. *superciliaris*. I found it breeding in the month of May in one of the few clumps of trees at Muangla.'

"Muangla lies to the east of Bhamo."

Mr. J. D. de la Touche (*The Ibis*, 1892, p. 429) says it is "abundant and resident at Foochow and Swatow."

Captain S. S. Flower, describing the birds of a Bangkok Garden (*The Ibis*, 1898, p. 423) says: "The Black-necked Mynah can be seen here all the year round in greater numbers than any other bird, except the Crows and Sparrows. They spend most of their time walking in small parties on the grass lawns in search of food, and are very tame. Their handsome plumage generally attracts the attention of visitors, and we have few better songsters. They sing both when on the ground and when perched on the branch of a tree, and make a great parade when singing, puffing out the chest and opening the mouth very wide. The young birds made their appearance on the lawns with their parents in the first week in July; their brownish heads and necks give them a very different appearance from the old birds. Both this and the next species make amusing and cheerful pets, and thrive in a cage."

Speaking of the birds of the Southern Shan States (*The Ibis*, 1901, p. 540), Col. G. Rippon says that this species is a giant among the Mynahs, and is very conspicuous both when flying and on the ground. He thus describes the soft parts: "Iris very pale yellow; bill black, lighter at culmen; legs and feet very pale horn-coloured." It is strange how each observer describes the soft parts differently.

Mr. J. C. Kershaw, describing the birds of the Quang-

tung Coast (*The Ibis*, 1904, p. 238), says: "One of the commonest resident birds, breeding in March, when it builds a large untidy nest of coarse grass, roots, and dry pandanus-fibres, lined with finer root-fibres. Two or three nests are often placed in a tree almost bare of leaves, where they are conspicuous objects for miles around."

Messrs. La Touche and Rickett, describing the nesting of birds in Fohkien (*The Ibis*, 1905, pp. 39, 40), observe: "The nest is a large domed structure of irregular shape, composed of dry grass, straw, leaves, twigs, and, in fact, any materials that come handy, even such as string, paper, hair, and rags. It is very conspicuously placed in some pine or tall tree at a good height from the ground.

"The eggs are laid in April, and number from four to six in a clutch. They are greenish blue, with a considerable amount of gloss. In shape they vary from narrowly ovate to oval. Thirty-nine specimens average 1.25in. by .91in. There are two, or perhaps three, broods in a season.

"These birds' antics at pairing-time are most absurd to watch. One sidles up to its mate uttering its everlasting '*tee-a-chee*' with widely open bill; the other sits with puffed-out plumage, its bill buried in the breast-feathers; then follows a sham squabble, consisting of much snapping of beaks and playful peckings, after which they fly off to another tree and repeat the performance. Young birds when following their parents constantly utter a harsh 'tcherk.'"

Although Russ overlooks the fact, two examples of this Mynah were purchased for our Zoological Gardens in 1866, and a third in 1873; in 1876 Charles Jamrach received two specimens and Mr. Schlechtendal obtained a specimen. In 1878 the director of the Berlin Aquarium exhibited two as great rarities at the "Ægintha" Exhibition in Berlin, Miss Hagenbeck exhibited two in 1887 at the "Ornis" Exhibition, and in 1891 G. Reisz, of Berlin, secured an old bird and a young one. Doubtless other examples of this common Chinese species have come to hand.

Black-winged Mynah (*Graculipica melanoptera*).

White here and there (but especially on the head, rump, thighs, and under tail-coverts tinted with creamy buff); bastard wing and primaries black, the latter white at base; secondaries bronze-brown, with bronze-green edges; tail greenish-black, tipped with white; the small tenth primary white below; bill and feet yellow; irides nearly white. Female smaller, but similarly coloured. Hab., Java, Madura.

Mr. F. Nicholson (*The Ibis*, 1881, p. 153) says: "Roof of mouth black. Seeds of rice in stomach." The name given to it by the natives appears to be "Kalung putih" or "Kalery Cumbang." Dr. Russ says that this species was first imported alive in 1862, when it arrived in the Amsterdam Zoological Gardens, and in 1891 two beautiful examples again reached the same gardens. The dealer, G. Reisz, of Berlin, first secured it in 1891, but only one example, which presently found its way to the collection of Prince Ferdinand of Bulgaria. Miss Hagenbeck exhibited one at the "Ornis" Exhibition in 1893. Since then it has come to hand singly here and there, and has reached the Berlin Zoological Gardens.

Common Mynah (*Acridotheres tristis*).

The prevailing colour is vinous brown, deeper, richer, and more glossy above than below; the crown, nape, lores, ear-coverts, and sides of face are glossy greenish black; the feathers on the forehead erected, but hardly forming a crest; eyelids black, but the naked patch below and behind the eye bright ochre-yellow; the chin, throat, and breast black, less glossy than on the upper parts, and seeming almost ashy in certain lights; bastard-wing black, some of the feathers white externally; primary coverts white; primaries black, white at the base, and brownish internally, the inner secondaries blackish, but the outer ones deep glossy brown; tail dull black, the central feathers slightly greenish, the remainder tipped with white, which increases in width from within outwards; centre of abdomen brownish white; vent and under tail-coverts pure white; bill and feet ochre-yellow, the claws browner, iris chestnut brown. The female is very like the male, but the bill appears to be slightly longer and the wings are shorter. Hab., Afghanistan, India generally, Burma, and Tenasserim; introduced into Mauritius.

The common Mynah is not specially striking in colour; it is about the size of a Blackbird; Jerdon gives the total length as "about 10in.," and Sharpe as 9½in.

According to Jerdon this is "one of the commonest birds in the country, affecting towns, villages, and the neighbourhood of man rather than the jungles. It roosts generally in large numbers, in some particular tree in a village or cantonment, and morning and evening keeps up a noisy chattering concert. Soon after sunrise the birds disperse, and in parties of two, four, six, or more, wing their way in different directions to their various feeding-grounds. Some remain about villages and cantonments, looking out, like the crows, for any fragments of cooked rice that may be thrown out by the side of a house, or even coming into a verandah for that purpose; others attend flocks of cattle, which they follow while grazing, picking up the grasshoppers disturbed by their feet, while some hunt for grain or fruit." "It has a great variety of notes, some of them pleasing and musical, others harsh; some have a resonant metallic sound."

This bird breeds, like our English Starling, in nooks and under eaves of houses, or in holes in trees; it lays four or five pale bluish-green eggs.

The Common Mynah is freely imported, and therefore by no means expensive; Russ, however, puts the price in Germany at from 15 to 20 marks, and when to a certain degree tamed, at as high a figure as 45 marks. If I remember rightly my example cost me 5s.; it was certainly not much more.

I purchased an example of this species about 1893 or 1894, and kept it in an aviary with Blue-birds and one or two other species with which I found it agree very well. It did not, however, prove a very interesting or specially intelligent pet; possibly it may have been out of sorts, for it certainly did not live many months.

In captivity the Common Mynah is said to become very tame, and to learn both words and sentences; but my somewhat short experience of the species did not enable me to confirm these statements, which are doubtless true.

In the trade this is often called the "Brown Mynah"; but the latter (*A. fuscus*) has no naked patch about the eyes, though in other respects, as in its habits, it is very similar. It is said to vary also in the colouring of the iris, which is either pale grey or yellow, according to whether it is caught in Southern or Northern India.

Indian Mynah (*Acridotheres ginginianus*).

Above dark grey, rather paler on rump and upper tail-coverts, darker on lesser wing-coverts; median coverts greenish-black edged with grey; greater coverts and flights black, green externally, somewhat bronzy on secondaries; bastard wing black, reddish-buff exter-

nally; primary-coverts pale reddish-buff; primaries buffish at base; tail greenish-black, increasingly reddish-buff at tips, the outer web of the outside feather being almost wholly of that colour; crown and nape greenish-black; sides of head mostly black; under surface pale ashy, pale pinky-buffish down the centre; sides, flanks, and thighs slate-grey; under wing-coverts and axillaries reddish-buff; flights below black, white near the base; bill reddish-orange with pale tip; feet dull orange or yellow, paler on toes; irides red; naked orbital skin, dull red or reddish; inside of mouth fleshy. Female said to be larger; wing shorter. Hab., Afghanistan and Northern and Central India.

According to Blyth ("Jerdon's Birds of India," Vol. II., p. 327) "abounds as soon as the banks of the river become of sufficient height for it to burrow in with tolerable security. It has the usual habits of the group, feeding much with cattle, and partaking alike of insects, grain, and fruit. It breeds in holes in river banks, usually in large societies; also in holes in walls, as I saw commonly in Ghazeepore and neighbouring country, and lays, according to Theobald, as many as seven or eight eggs of the usual greenish-blue colour."

Russ observes that this bird arrives extremely rarely and singly in the German market, but Schlechtendal and Prince Ferdinand possessed it; he seems not to have been aware that the London Zoological Society had it in 1860, 1862, 1865, and 1885.

Brown Mynah (*Acridotheres fuscus*).

Above dull slate-grey, clearer on hind neck and mantle; lesser and median coverts bronze brown with greyish margins; greater coverts and inner secondaries with black margins; primary-coverts white; remaining wing-feathers black, the primaries white at base and bronze brown at end of inner web; outer secondaries bronzy externally; tail black, tipped with white, greenish on outer webs of feathers; crown and sides of head greenish black; throat and chest dark slate-grey, shading into ashy buffish on breast, sides and flanks; abdomen clear buffish; under tail-coverts creamy white; thighs dark slate-grey; under wing-coverts blackish, tipped with grey; axillaries ashy buffish; flights below blackish; a white patch at base of primaries; bill blue-black at base, orange-yellow at tip; mouth bluish; feet orange-yellow; claws greenish horn; irides bright yellow. Female similar, but with shorter wings.

Southern Brown Mynah (*Acridotheres mahrattensis*).

Larger; bill orange-yellow, dusky on sides at base; feet yellow; irides bluish grey.

The typical form inhabits the Sub-Himalayan region to the Central Provinces of India and eastwards to Assam, Burma and Tenasserin; and its southern race, Southern India, as high as the Godavery Valley on the east and the neighbourhood of Ahmedabad on the west. (Sharpe.)

Jerdon observes ("Birds of India," Vol. II., pp. 328, 329):—"This bird has almost the same habits as the common Mynah, like it often attending cattle, but also frequently seen in gardens, as at Ootacamund, eating seeds and fruit of various kinds; and it is very often seen clinging to the tall stem of the large Lobelia, so common on the Neilgherry hills, feeding on the small insects (bugs chiefly) that infest the capsules of that plant. It is most abundant on the Neilgherries, where it is a permanent resident, breeding in holes in trees, making a large nest of moss and feathers, and laying three to five eggs of a pale greenish-blue colour. From what Hodgson says, it is probably also a permanent resident in Nepal, where, he says, 'perpetually associating with *A. tristis*, every large flock of which has many individuals of this bird among them.'" "Captain Tytler says that at Dacca this bird builds in the old temples and houses about the Sepoys' huts."

Russ says that this species is extremely rarely imported into Germany; it was, however, present in the Amsterdam Zoological Gardens in 1854 and the London Gardens in 1868. In 1893 it was bred in the Berlin Gardens, laying three eggs of a bluish colour in an ordinary Starling's nest-box; both sexes incubated alternately for fifteen days, but only one youngster was hatched and reared.

In addition to Russ' record, our Zoological Gardens purchased it again in 1873 and 1878, and a specimen was presented to them in 1889. Of the race *A. mahrattensis* they also purchased an example in 1872 and a second in 1873. One or two examples that I have seen from time to time have been of this grey-eyed race, which I believe is more frequently imported than the northern type.

Crested Mynah (*Acridotheres cristatellus*).

The adult bird is silky blue-black, with a somewhat irregular crest of recurved feathers from the middle to the base of the bill (but no crest on the crown, as represented in some scientific works). The upper parts of the body are less glossy than the upper parts; one bastard wing-feather is white towards the end of the outer web; the outer half of the primary coverts, the basal half of the primaries, and the base of the inner web of the secondaries are white; the tail-feathers are tipped with white. Bill pale yellow, the base of the lower mandible pink, feet orange, iris deep amber yellow. Young birds are brown and have no crest, the bill and feet are browner, and the iris pale greenish-yellow. Hab., Central and Southern China, and the Island of Luzon (Philippines), supposed to have been introduced.

Messrs. La Touche and Rickett (*The Ibis*, 1905, p. 40) observe:—"This common resident breeds in holes, in trees and walls, as well as under the eaves of houses. The nest is a regular rubbish-heap of dry grass, straw, leaves, feathers, etc. The wing and tail feathers of pigeons, kites, Crows and Magpies are largely used. In every nest examined by Rickett there was a snake's slough or part of one, and our men were once told by a native that *every* Mynah's nest was thus provided.

"The eggs are pale greenish blue. These birds are very noisy and pugnacious in spring."

According to Dr. Russ, this is "one of the most abundant and most charming Starlings in the trade; is nevertheless unsociable, as well as spiteful, violent, and easily excited. A female belonging to Schlechtendal laid eggs on several occasions. Song copious and pleasing; it also imitates the notes of other birds, learns to speak excellently; is unusually tame. It is fond of berries and other fruits, as well as grain." Russ also states that Wiener bred the species successfully in 1875; but if he did he has not mentioned the fact anywhere that I am aware of. It is a favourite Chinese cage-bird, and not infrequently imported; but it is never very cheap.

For many years my friend Mr. James Housden, of Sydenham, had a most entertaining specimen of this Mynah, which trumpeted, whistled most melodiously, and talked Hisdostani. I was so much attracted by the bird that I asked him, if he ever chanced to meet with a specimen at not too exorbitant a price, to secure it for me.

From what I saw of Mr. Housden's old bird and a

second which he subsequently turned loose in the same aviary, I am not inclined to endorse Dr. Russ's statement as to the malice of the Crested Mynah. If he was reckless enough to associate so powerful a bird, and one 10½ in. in length, with tiny Finches he had nobody to blame but himself. A big bird may kill a small one in play rather than from wanton cruelty, and I should judge this Mynah as tolerably peaceable when associated with birds of its own size.

Mr. Housden secured me a specimen about 1896, for which I paid 30s., and although it has since been offered in the London market for about half that price, I was well content. It was a most amusing bird, and very fond of me, showing its affection, however, exactly in the opposite manner from my Blue-bearded Jay; for, whereas the Jay would always attack any stranger who put a finger near his flight, the Mynah would only attack me and utterly ignore a stranger. He whistled clearly and tunefully and occasionally trumpeted, after which he invariably bowed in a ludicrous fashion, making the most extraordinary rasping sound with

CRESTED MYNAH.
(*From a living specimen.*)

each bow; he rarely attempted to talk, but sometimes said "Joey" once or twice in a low, harsh voice, so that we adopted that as his name. I fed him upon the usual soft food with grapes, banana, apple, or orange, cockroaches, mealworms, smooth caterpillars, or spiders. He died on November 28, 1906, a very old bird (for he was old when I bought him), and regretted by all who had had the pleasure of making his acquaintance.

BALD-HEADED STARLING (*Sarcops calvus*).

Dark glossy cinereous, blacker at base of feathers, the back sometimes mostly brown or black; a white patch on upper part of scapulars; wings and tail black; head naked, dull pinky-white or flesh-red, excepting the lores, forehead, a line down centre of crown, joining a collar which passes round the ear-coverts, which are also of the same colour, the cheeks and the under surface, all of which are black; sides and flanks silver-grey; under tail-coverts washed with dark cinereous; flights below browner than above; bill and feet black, toes and claws brown; irides rufous-brown or chestnut. Female similar, but said to have a longer wing. Hab., Philippines and Sulu Islands.

Mr. J. Whitehead (*The Ibis*, 1899, p. 241) says:—"Quite one of the ornithological features of the Philippines. Like the Great Hornbill, this species has also been noticed by the Spaniards, and is known to them as the 'Collato.' It is supposed to learn to imitate the human voice, and for that reason it is often kept in a cage. The Collato is a busy, lively bird, being found in numbers in the forests when its favourite food is ripe. It is also very partial to dead tree-trunks, nesting and roosting in the numerous Woodpeckers' borings. The noise made by the wings during flight is very audible. In Samar a pair were very busy prospecting some old posts within a few feet of our house, but we left before they had commenced to build. The note is a peculiar click, metallic but not displeasing. The species reaches an elevation of 3,000 ft. in Benguet."

In 1905 Mr. Walter Goodfellow brought home three specimens of this species for Mrs. Johnstone, who published an illustrated account of them in *The Avicultural Magazine*, New Series, Vol. IV., pp. 191, 192. She says: "I feed them on an ordinary insectivorous mixture, soaked water biscuit squeezed very dry, with a few sultana raisins. They are exceedingly fond of the latter dainty, also oranges, which they will absolutely finish with the exception of the peel. They love mealworms, but seemed rather afraid of some cockroaches I introduced into the aviary, killing them with sharp pecks, given them as they dart down and back from an upper perch (much as I have seen my Grackles kill a mouse), but they never attempted to eat them." These birds were subsequently sent to the London Zoological Gardens.

Typical Mynahs or Grackles (*Eulabetidæ*).

This family is based upon the genus *Eulabes* = *Mainatus*. The former name takes precedence, having been published by Cuvier in 1817, otherwise it would be a question whether, if these birds are to be separated as a distinct family from the Old World Starlings, it should not be called *Mainatidæ*.* I first illustrated the sexual differences in the bill in my little book, "How to Sex Cage-Birds," p. 79. These birds have a bare sort of wattle suspended from the back of the eye and passing into an almost horseshoe-like lappet running from the back of the eye to the nape, and back again towards the crown.

These birds are nearly related and very much alike, both in plumage and habits; they are talented mimics, and some of them (when taken young and carefully trained) become excellent talkers; but they are quite unsuitable for cage culture, requiring an aviary, in order not only to do them justice, but to render them pleasant pets. They are, however, extremely nervous, easily startled, and from their excessive greed are apt to get too fat—one of the most frequent causes of death with these birds. The Hill Mynahs are hopping birds, not progressing by walking like the more typical Mynahs.

SOUTHERN HILL MYNAH (*Eulabes religiosa*).

Glossy purplish-black; the lower back and upper tail-coverts with green reflections; wings and tail black, the latter slightly greenish; a white patch on the primaries; head glossed with green excepting on the ear-coverts, the green extending on to the throat and front of neck; the chest purplish; remainder of under surface black with the edges of the feathers green; bill orange-yellow; wattle and lappet bright yellow, bluish at upper edge; feet lemon-yellow; irides brown with dark-mottled white outer edge. Female smaller than male, with shorter wing and much weaker bill. Hab., Ceylon and South India.

Col. Legge ("Birds of Ceylon," Vol. II., pp. 683, 684 gives the following account of its habits:—"This

* The Editors of *The Ibis* did not see why *Gracula* should not be retained, but then what should we do with *Graculus*?

showy bird frequents high jungle and forest, being especially fond of the vicinity of rivers, and likewise of open clearings in the woods which are studded with tall dead trees. In the Pasdun Karale, between the Maguru Ganga and Kalatura, where it is common, it is found about native villages situated in wooded knolls, and affects the kitool-palms there more than other trees. Like the next species, it has a habit of launching itself out into the air with a shrill whistle and returning to its perch. Its note is higher than that of the Hill Mynah and more metallic-sounding. It is caught and kept as a caged bird by the natives in parts of the western and southern provinces, and is said by them to talk well. It usually associates in pairs, except when feeding on the fruit of some favourite tree, when I have found it in small parties. It is not a shy bird, having very little fear of a gun-shot; indeed, I have shot several out of the same tree without any member of the little party taking flight. It feeds on various berries and fruits, which it swallows whole. Jerdon testifies to the same local propensity which I have observed to obtain with it in Ceylon; he says 'It seems partially distributed, as you may pass through miles of forest without seeing a single specimen. It is generally found in small parties of five or six, frequenting the tops of the loftiest trees, and feeding on fruit and berries of various kinds. I never found that insects had formed any portion of its food. The song of this bird is very rich, varied, and pleasing . . . it is not often seen in cages in India; but it is very highly prized both for its powers of song and speech, which are said to surpass those of all other birds in distinctness. It has probably been from erroneous information that this species was named *religiosa* by Linnæus, as I am not aware of its being considered sacred by the Hindoos.'" Elsewhere ("Birds of India") he suggests that the great Swedish naturalist probably confounded it with *Acridotheres tristis*, a bird attired in "sad-coloured" plumage, and was thus led to apply to it its inappropriate title.

"*Nidification.*—The Black Myna was breeding on the Pasdun Korale on the occasion of a visit I made to that part in August; but I did not procure its eggs. It builds in holes, and is said not to lay its eggs on the bare wood, but to line the bottom of the cavity with grasses, roots, feathers, etc. Mr. Bourdillon writes that in Southern India it makes its nest of straw and feathers in a hole a considerable height from the ground. The eggs are described as 'very gracefully elongated ovals'; the shell is smooth and fine, with a rather faint gloss; ground-colour greenish-blue, more or less profusely spotted or 'splashed' with purplish chocolate-brown, and very pale purple. Dimensions 1.35 to 1.37 inch in length, by 0.87 to 0.9 inch in breadth."

This species has been in the Amsterdam Zoological Gardens since 1845, and in the London Gardens since 1866, no less than twenty examples having been exhibited by our Zoological Society between 1866 and 1895. I cannot say that I ever heard one of these birds speak half as distinctly as either an Amazon or a Grey Parrot; the words are intelligible, but singularly harsh and ventriloquial. The earliest example I remember of this species at our Gardens, perhaps the 1866 specimens, was a somewhat humorous bird; he used to chatter to himself about a cup of coffee and other matters until he had collected a crowd round his cage, and then utter a piercing shriek which made everybody jump; then he would say, "What a noise to-day!" Many years later a specimen at the Gardens amused me by its stolid stupidity. A friend with me was very anxious to add to the accomplishments of this bird, but to all overtures he only had two answers—"What?" and "All right!" What the name *religiosa* has to do with such a crow-like bird it would be hard to say, and probably, after the tuition which some specimens receive on board ship, it is sometimes a sad misnomer.

Javan Hill Mynah (*Eulabes javanensis*).

Considerably larger than the preceding species; the lores and sides of crown intense black; rest of head, neck, shoulders, back and under surface up to the abdomen black glossed with purple, remaining plumage black glossed with green; primaries with a broad white patch; wattles and lappets large, divergent, uniting on the nape in old birds. sulphur-yellow; bill orange-vermilion tipped with yellow; feet sulphur-yellow; irides reddish-brown (according to Russ the lappets and feet are dark yellow); sexes differing as usual. Hab., South Tenasserim to Malacca, Sumatra, Java, and Borneo.

Mr. F. Nicholson observed this species 500 feet above Estate House on Kosala (Java), feeding on Hooroo madang (*The Ibis*, 1881, p. 153). In Sumatra he obtained it on the River Rawas, 1,700 feet, and describes the irides as dark brown; tip of bill orange, rest of it light red; legs and feet orange (*The Ibis*, 1883, p. 254).

Mr. C. Hore, speaking of it in Borneo (*The Ibis*, 1893, p. 402), says: "Common everywhere, in pairs. A good whistler and talker, and often trained by the Malays and Chinese. Native name 'Tiong.'"

According to Russ, Dr. Hagen says that a friend of his had one of these birds for a long time in captivity, and was delighted with it because "it spoke almost better than the most talented Parrot. It laughed, coughed, and expectorated like a human being, and always with the same sounds as its master; it crowed like a cock, neighed like a horse, creaked like a door, screeched like an unoiled wagon-wheel, grunted like a pig, etc. If a person entered the house it wished him 'Good morning!' or 'Tabé Tuanku, tabé'; it whistled and called the dog if the latter barked, and so on. In short, there is scarcely a bird more entertaining than the Tiong. It places its nest in the trunk of a tree, preferably in old, decayed trunks of the sugar-palm, and its clutch consists of four greenish-blue eggs with dark splashes." It reached the Amsterdam Gardens in 1852 and the London Gardens in 1871 and 1887.

Greater Hill-Mynah (*Eulabes intermedia*).

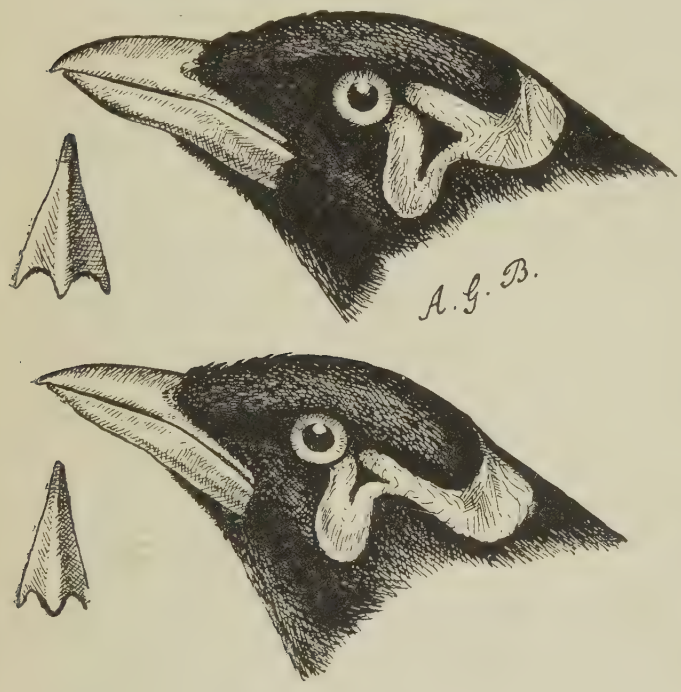
Similar to the preceding species, but much smaller, and with the patch of feathers extending from back of eye triangular; eyelids well-feathered; wattles and lappets bright yellow, more or less orange in front, bluish near the eye; bill deep orange with yellow tip; inside of mouth fleshy; feet yellow; irides brown. Female smaller, the bill much weaker. Hab., Central India, the Himalayas from Kumaon to Assam, Burma to Tenasserim and Northern Malaysia, eastward to Cochin China, and probably China and Hainan. (Sharpe.)

According to Jerdon the habits of this species do not differ from those of the Southern Hill-Mynah. This bird makes a very interesting pet, its great musical talent being supplemented by a capacity for learning to talk very distinctly, though in a somewhat hoarse voice.

I purchased an example of this species about 1892, and finding it filthy in the extreme when kept in a cage, I turned it into a moderate-sized aviary with Red-crested Cardinals, a Rosella Parrakeet, and one or two English Starlings. It was heavy and sluggish in its movements, and never interfered with the other birds. From the heavy, lumpy way in which it dropped from perch to perch my wife nicknamed it "Plop."

This bird used to reproduce every sound that it had

heard on board ship, with the exception of words, not one of which did it ever learn to speak, but its imitations were marvellously realistic, its favourite sounds being the action of the screw when the vessel is stationary, the soft splash of a rope dropping on the surface of the water, and lastly those objectionable sounds produced by bad sailors in rough weather. I fed this bird on my usual soft food, fruit, and insects, sometimes adding a few scraps of raw meat, but I do not recommend the last item, although it suits the species of *Acridotheres*. It died through the bursting



MALE AND FEMALE OF THE GREATER HILL-MYNAH.

of the great blood-vessel of the heart, from sudden fright caused by a Starling alighting on its back in the dark.

CEYLON MYNAH (*Eulabes ptilogenys*).

Black, glossed with purple on the crown, sides of head, neck all round, hind neck, mantle, broad borders of greater wing-coverts, and narrow margins to innermost secondaries, tail, throat, chest, thighs, edges of under wing-coverts and axillaries towards edge of wing; glossed with green on back, rump, upper tail-coverts, scapulars, lesser wing-coverts, fore neck, breast, and remaining underparts; primaries with the usual white patch; wattles apparently wanting, judging from Col. Legge's illustration; lappets bright yellow; bill orange-red, the upper mandible black from gape to nostril, and the lower for nearly half its length; feet gamboge-yellow, claws blackish; irides greyish-white dappled with brown. Female said to be larger, but certainly with weaker bill; irides white or yellowish-white. Hab., Ceylon.

Col. Legge thus describes its habits ("Birds of Ceylon," Vol. II., p. 686): "This handsome bird frequents for the most part the tops of tall trees; it associates in small parties, and is very partial to the sides of deep ravines, lofty precipices, and overhanging woods. It is fond of launching itself out into mid-air from these dizzy heights, uttering its shrill metallic-sounding whistle and loud calls, and, circling round, it returns to its lofty perch on the top of some huge Doon-tree, and there continues the exercise of its vocal powers. Its well-known voice consists of a piercing and not unharmonious whistle repeated several times and then followed by a series of loud guttural calls, some of which resemble the syllables choooke, chi-ooope; these are, however, only uttered as call-notes while it is perched. The Mynah talks well, and is eagerly sought after as a caged bird, and much prized by the Kandyans as a pet, as it is extremely difficult to procure from the nest. It is a restless bird, particularly towards roosting-time, and in forests where it is abundant I have often seen it roaming about in small parties, dashing down the gloomy gullies, and sweeping backwards and forwards with frequent rapid descents, which cause a long rustling sound. After alighting on the tallest tree to be found, these restless parties indulge in sundry piercing whistles, and then start off again on their peregrinations until a suitable spot for their night's quarters in the foliage of some vast tree is found.

"In its habits it is, like the rest of the Grackles, entirely arboreal, and its diet is frugivorous. Among the many fruits to be found in the forests of Ceylon there are none of which it is so fond as the wild cinnamon and the nutmeg. The latter they swallow whole, digesting the mace from the exterior of the nut, which they afterwards reject. The habit ascribed by Layard of frequenting pastures and perching on the backs of cattle probably appertains to the Common Mynah (*Acridotheres melanosternus*), for it is essentially an arboreal bird, and does not descend to the ground at all.

"*Nidification.*—This species breeds in June, July, and August, laying its eggs in a hole in a rotten tree, or in one which has been previously excavated by the Yellow-fronted Barbet or Red Woodpecker. It often nests in the sugar or kitool palm, and in one of these trees in the Peak forest I took its eggs in the month of August. There was an absence of all nest or lining at the bottom of the hole, the eggs, which were two in number, being deposited on the bare wood. The female was sitting at the time, and was being brought fruit and berries by the male bird. While the eggs were being taken the birds flew round repeatedly, and settled on an adjacent tree, keeping up a loud whistling. The eggs are obtuse-ended ovals, of a pale greenish-blue ground-colour (one being much paler than the other), sparingly spotted with large and small spots of lilac-grey, and blotched over this with a few neutral brown and sepia blots. They measure from 1.3 to 1.32 inch in length by 0.96 to 0.99 in breadth."

Russ says that hitherto this bird has, to his knowledge, only been represented in the Amsterdam Zoological Gardens.

CHAPTER III.

BOWER-BIRDS (*Ptilonorhynchidæ*).

I believe that most writers consider these birds to be more nearly related to the Birds of Paradise than to any others; Gould undoubtedly thought so, and states as much ("Handbook to Birds of Australia," Vol. I., p. 441.). Dr. Sharpe, however ("Catalogue of Birds in the Collection of the British Museum," Vol. VI.), places them as a sub-family of the Timeliine Thrushes, and observes:—"Their habits seem to me to associate them with the Ground Thrushes and Babblers, of which they will form an outlying group with affinities towards the Crows and Paradise-birds." The late Professor Alfred Newton ("Dictionary of Birds," p. 51) says:—"By most systematists these birds are placed among the *Paradiseidæ* (Birds of Paradise); but in the 'British Museum Catalogue of Birds' (VI., pp. 380-396) they are to be found in the 'limbo large and broad' of *Timeliidæ*—though allowed the rank of a sub-family, *Ptilonorhynchinæ*, the name being taken from the feathered and not the bare (as might, from its etymology, have been expected) condition of the base of the bill."

The Satin Bower-bird certainly has the aspect of a glorified Crow; and, in its awkward, ridiculous side jumps and alternate flapping of first one wing and then the other, it behaves much as I have seen a Raven do when in a sportive humour. The bird never struck me as having anything in common with the Thrushes; its love of bright colours and tendency to carry about pebbles, bones and feathers to decorate its tunnels (bowers) is more characteristic of the *Corvidæ* and *Sturnidæ*, and its extraordinary songs bear a vague resemblance to some parts of the performance of our European Starling. Its capacity for mimicry and learning to talk or imitate the mewing of a cat again indicate affinity to the Crows and Starlings rather than to the Thrushes. Though a trifle larger, this Bower-bird, both in its long awkward hops, the general outline of its heavy bill (the upper mandible of which, however, is more heavily feathered as well as the sides of the lower mandible) reminds one not a little of the Hill-Mynahs.

After I had completed the present chapter, a number of species of Bower-birds, Paradise-birds, and Manucodes were imported by Mr. C. B. Horsbrugh, who was sent out to New Guinea to that intent by Sir William Ingram and the Zoological Society of London. Some of these birds are of considerable beauty; and I should feel bound to include them in the present work, if it were not for the fact that it has been decided in future to preserve them strictly, only permitting them to be captured or shot for public institutions This will necessarily place them entirely out of the reach of private aviculturists.

In an article on Prince Rudolph's Bird of Paradise, Sir William Ingram observes that: "During nearly fifty years before the year 1904, only sixteen Birds of Paradise had been received at the London Zoological Gardens, and these only arrived one or two at a time." He then goes on to mention that Mr. Walter Goodfellow, in 1904, landed in England two King Birds, two *Paradisea minor* and one *Paradisea apoda*; in 1905, twenty Birds of Paradise were landed at Genoa: three King Birds, one *Paradisea minor* and sixteen *Paradisea apoda*. In 1907, twelve pairs of King Birds and six females of *P. apoda* were imported, and in 1908 more than fifty birds were brought home belonging to seven species not previously imported, including one specimen of *P. rudolphi*.

For the reason already mentioned, I shall confine myself to the mere enumeration of such species as have come to hand since the ensuing chapter was written:—

Barbet-like Cat-bird (*Ælurœdus buccoides*).

Two examples were presented to the London Zoological Society in 1908.

Black-headed Cat-bird (*Ælurœdus melanocephalus*).

Three examples reached the London Zoological Gardens in 1908.

Unornamented Bower-bird (*Amblyornis inornata*).

A pair was received by Mr. E. J. Brook in 1909.

Gardener Bower-bird (*Amblyornis subalaris*).

Two examples were imported in 1908, and were presented to the London Zoological Society. Mr. E. J. Brook received a female and two males in 1909.

Magnificent Rifle-bird (*Ptilorhis magnifica.*)

One specimen was brought home in 1908.

New Guinea Rifle-bird (*Ptilorhis intercedens*).

One specimen also of this species in 1908: this and a young male reached the Zoological Gardens the same year.

Meyer's Bird of Paradise (*Epimachus meyeri*).

Three males and two females were received by Mr. E. J. Brook in 1909.

Count Raggi's Paradise-bird (*Paradisea raggiana*).

Several examples were imported in 1908. Twelve specimens reached the London Zoological Gardens in that year.

Prince Rudolph's Bird of Paradise (*Paradisornis rudolphi*).

One example only was secured; it was deposited at the Gardens. Mr. E. J. Brook received a pair in 1909.

Magnificent Bird of Paradise (*Diphyllodes magnifica*).

Eight specimens were brought to England in 1908.

Hunstein's Bird of Paradise (*Diphyllodes hunsteini*).

Number of specimens not stated, but eighteen found their way to the Gardens at Regent's Park. Mr. E. J. Brook received a specimen in 1909. He also received the young of *Loria mariæ*.

Six-wired Bird of Paradise (*Parotia sexfilata*).

Seven specimens were imported in 1908.

Lawes' Bird of Paradise (*Parotia lawesi*).

Number of examples not noted, but fourteen found a home in the Gardens at Regent's Park.

Superb Bird of Paradise (*Lophorina superba*).

Mr. E. J. Brook received two pairs in 1909.

Princess Stephanie's Bird of Paradise (*Astrarchia stephaniæ*).

Mr. E. J. Brook received three males and four females in 1909.

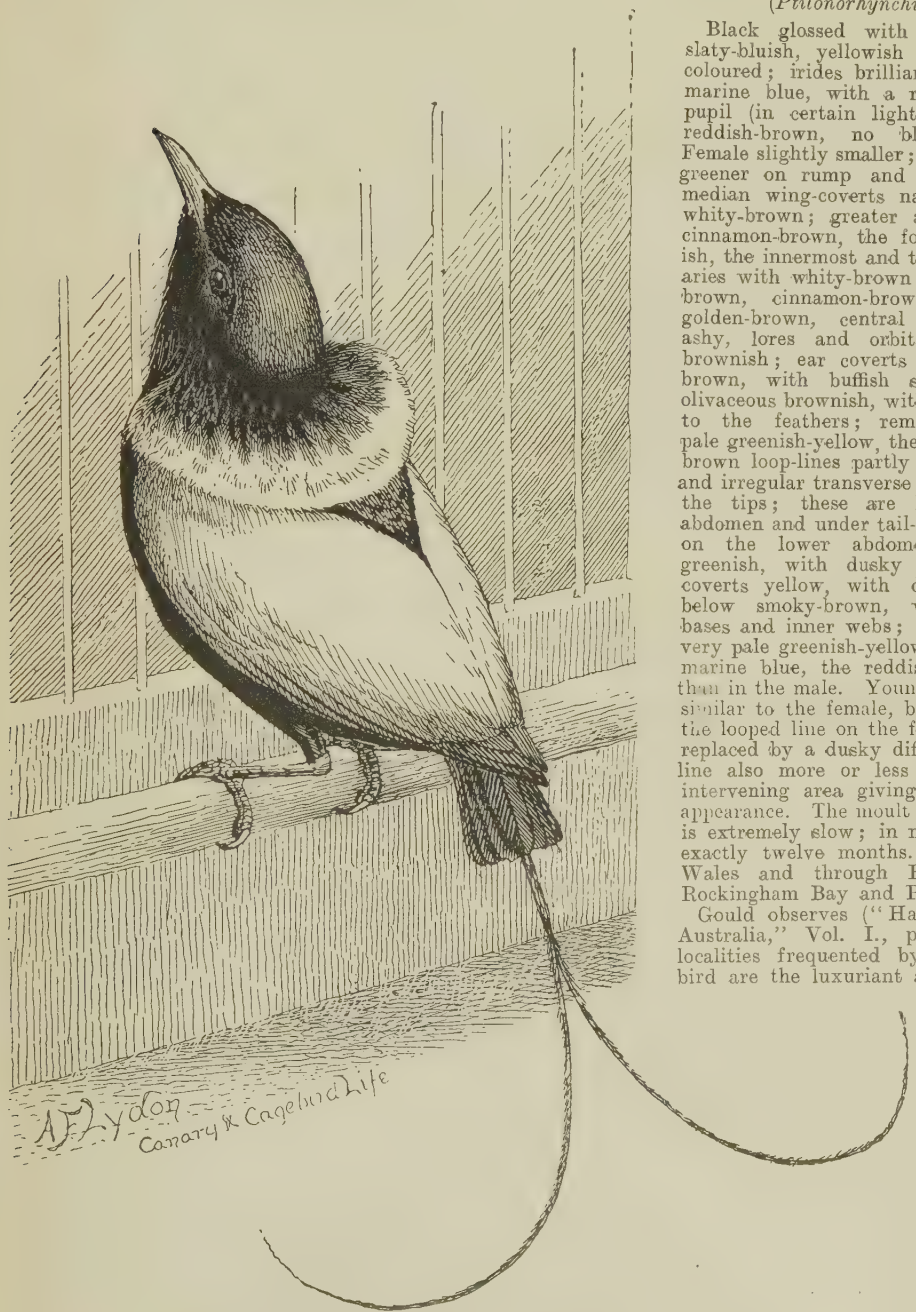
Purple Manucode (*Phonygama purpureo-violacea*).

Probably five specimens came to hand; certainly that

number reached the London Zoological Society's Gardens in 1908.

GREEN MANUCODE (*Phonygama chalybeata*) (*sic*).

It is stated that four examples of Manucodes were received belonging to this and the preceding species, but is this distinct from the *Manucodia chalybeia* recorded as having come in the preceding collection, when eight examples came to hand; and is it not *Manucodia chalybata*, of which *Phonygama chalybeus* is a synonym? If so, it was not received for the first time in 1908, as it reached the London Gardens in 1881.



HUNSTEIN'S BIRD OF PARADISE.

SATIN BOWER-BIRD
(*Ptilonorhynchus violaceus*).

Black glossed with Prussian blue; bill slaty-bluish, yellowish at tips; feet flesh-coloured; irides brilliant transparent ultramarine blue, with a red circle round the pupil (in certain lights the irides appear reddish-brown, no blue being visible). Female slightly smaller; above greyish-green, greener on rump and upper tail-coverts; median wing-coverts narrowly tipped with whity-brown; greater and primary coverts cinnamon-brown, the former slightly greenish, the innermost and the innermost secondaries with whity-brown tips; flights smoky-brown, cinnamon-brown externally; tail golden-brown, central feathers somewhat ashy, lores and orbital feathers slightly brownish; ear coverts and cheeks greyish-brown, with buffish shaft-stripes; throat olivaceous brownish, with dull greenish edges to the feathers; remaining under-surface pale greenish-yellow, the feathers with black-brown loop-lines partly bounding the shafts and irregular transverse arched lines towards the tips; these are less distinct on the abdomen and under tail-coverts, and wanting on the lower abdomen; axillaries pale greenish, with dusky bars; under wing-coverts yellow, with dusky bars; flights below smoky-brown, with bright yellow bases and inner webs; bill dark horn; feet very pale greenish-yellow; irides clear ultramarine blue, the reddish ring less marked than in the male. Young birds are somewhat similar to the female, but smaller, and with the looped line on the feathers of the breast replaced by a dusky diffused line, the outer line also more or less diffused, the small intervening area giving the bird a spotted appearance. The moult to the adult plumage is extremely slow; in my birds it occupied exactly twelve months. Hab., New South Wales and through Eastern Australia to Rockingham Bay and Port Denison.

Gould observes ("Handbook of Birds of Australia," Vol. I., pp. 442-444): "The localities frequented by the Satin Bower-bird are the luxuriant and thickly foliaged brushes stretching along the coast from Port Philip to Moreton Bay, and the cedar brushes of the Liverpool ranges." "Judging from the contents of the stomachs of the many specimens I dissected, it would seem that it is altogether frugivorous, or, if not exclusively so, that insects form but a

small portion of its diet. Independently of numerous berry-bearing plants and shrubs, the brushes it inhabits are studded with enormous fig trees, to the fruit of which it is especially partial. It appears to have particular times in the day for feeding, and, when thus engaged among the low shrub-like trees, I have approached within a few feet without creating alarm; but at other times the bird was extremely shy and watchful, especially the old males, which not infrequently perch on the topmost branch or dead limb of the loftiest tree in the forest, whence they can survey all round, and watch the movements of their females and young in the brush below."

Respecting the playing tunnels (bowers, as they are fancifully called) constructed by these birds, Gould says they are placed "on the ground, under the shelter of the branches of overhanging trees, in the most retired part of the forest; they differed considerably in size, some being a third larger than others. The base consists of an extensive and rather convex platform of sticks firmly interwoven, on the centre of which the bower itself is built; this, like the platform on which it is placed, and with which it is interwoven, is formed of sticks and twigs, but of a more slender and flexible description, the tips of the twigs being so arranged as to curve inwards and nearly meet at the top; in the interior the materials are so placed that the forks of the twigs are always presented outwards, by which arrangement not the slightest obstruction is offered to the passage of the birds. The interest of this curious bower is much enhanced by the manner in which it is decorated with the most gaily-coloured articles that can be collected, such as the blue tail-feathers of the Rose-hill and Pennantian Parrakeets, bleached bones, the shells of snails, etc.; some of the feathers are inserted among the twigs, while others, with the bones and shells, are strewed about near the entrances. The propensity of these birds to fly off with any attractive object is so well known to the natives that they always search the runs for any small missing article that may have been accidentally dropped in the brush. I myself found at the entrance of one of them a small, neatly-worked stone tomahawk of an inch and a half in length, together with some slips of blue cotton rags, which the birds had doubtless picked up at a deserted encampment of the natives.

"It has now been clearly ascertained that these curious bowers are merely sporting-places in which the sexes meet, and the males display their finery and exhibit many remarkable actions; and so inherent is this habit that the living examples which have from time to time been sent to this country continue it even in captivity. Those belonging to the Zoological Society have constructed their bowers, decorated and kept them in repair for several successive years."

In A. J. Campbell's "Nests and Eggs of Australian Birds" is an admirable photographic illustration of the nest and eggs of this species *in situ*. I therefore take the description of both from his valuable work, pp. 191, 192, as follows:—*Nest:* Open, shallow, somewhat loosely constructed of twigs; lined inside with leaves (*Eucalyptus*), and placed in a scrubby bush or tree, at a height varying from about ten to thirty feet from the ground. Dimensions over all: Diameter seven or eight inches, by five inches in depth.

Eggs: Clutch, two to three; shape, true oval; shell moderately fine in texture, surface glossy; colour varies from dark cream to dirty yellow, irregularly blotched and spotted with umber, cinnamon-brown, and a few purplish-grey markings. In some specimens the blotches are very bold, with the markings under the surface of the shell of a bluish-black shade. Occasionally there is a type with a lighter or paler coloured ground and smaller-sized markings. Others, again, have the markings more in the form of hieroglyphics. Dimensions in inches of a typical clutch: (1) 1.76 × 1.19; (2) 1.74 × 1.17.

Mr. Campbell tells us that "some seasons Satin Birds are very destructive in the gardens and orchards, eating clover, especially the flowers, English grass, cabbages down to the very root, and fruit. The late W. B. Bailey, Pimpama Nurseries, South Queensland, informed me of an instance in which he had about three acres of mandarin oranges stripped in a week. The birds are also fond of sweet potato tubers. I noticed at Mr. Bailey's residence a very handsome male bird which he had in captivity. It was in its youthful coat of mottled green when he first obtained it. It is interesting to learn that this bird did not don its full livery of blue-black till the fourth year. The bird was an excellent mimic, could talk, and imitate well the mewing of a cat."

In 1900 I described the behaviour of what I then believed to be a pair of Bower-birds in my possession, as follows:—"He constantly sings to the hen, puffs out his feathers, arches his back, alternately opens and shuts one wing or the other, flies round with a dropped quill feather in his beak, and once he so alarmed his wife that she turned on her back on the earth with open beak and claws up to defend herself. My man came running to me saying: 'He's done it; I said he would; he's killed her!' And certainly it looked like it until I went inside the aviary, when she was up and off to her favourite roost in a second.

"The song is a most comical performance, and resembles nothing so much as water, containing bits of cabbage-leaf, running down a sink, and interspersed here and there with clear Starling-like notes. The alarm note is a jarring monosyllable most like the word *scoot*, with a very rough hesitation on the *c*. As this species is particularly nervous and excitable, the alarm-note is often heard. It is difficult to express the sounds of the song in words, but the idea it conveys to the mind is a rapid *whozzle-whozzle-whozzle-sqrrrr*, with variations."

Briefly to review the history of my two Bower-birds, I may note that the supposed pair (palpably in nestling plumage, both small and with indications of pale spots on the green plumage) came into my possession in September, 1899, and at the end of a year one had assumed the adult plumage of the male, the other the adult plumage of the female. Naturally I concluded that I had secured an undoubted pair, although both sang and danced; and though they certainly quarrelled, that fact in no way disturbed my faith, because from my boyhood I had been taught that "the quarrels of lovers are the beginning of love."

When in July, 1904, the supposed hen began to assume male plumage and became so spiteful that I had to remove the undoubted cock, I concluded, as a matter of course, that disease of the ovary was affecting her plumage (see my short paper in the "Annals and Magazine of Natural History," Seventh Series, Vol. XVI., pp. 350-351). Later the perfect male plumage was acquired and retained permanently, and exactly three years later the bird died and proved to be a cock.

Why some cock birds should assume male plumage at the end of the second year, and others should disport themselves in female attire for six years or longer, is a problem which requires a good deal of explanation. My birds were only two out of half a dozen or more, all palpably young birds, imported in one batch.

In 1902 (*The Avicultural Magazine*, Second Series, Vol. I., pp. 63-68) Mrs. Johnstone published an in-

THE BLUE (PRINCE RUDOLPH'S) BIRD OF PARADISE.

teresting account of the nesting of this species in her aviaries. Unhappily no young were reared to perfection.

As regards feeding, I found that Gould's idea that this species is very slightly, if at all, insectivorous was quite erroneous. It will swallow cockroaches one after the other with the greatest avidity, as well as any other insects or smooth larvæ which one may supply, and, of course, spiders. Grapes are much relished, but banana, ripe pear, apple or orange are also eaten freely. Insectivorous food is taken in moderation, but the yolk of egg is always first selected and the remainder of the food only taken when the birds are hungry.

Australian Cat-Bird (*Ælurædus viridis*).

Above bright grass-green; a whitish patch on side of lower neck; median and greater wing-coverts and secondaries with yellowish-white tips; primaries slightly bluish on outer webs; inner webs of all the flights grey-brownish; tail feathers white-tipped, with inner webs blackish; head and neck slightly yellower than back; the neck and mantle with faint buffy-white shaft-lines; sides of head olivaceous, the ear-coverts with a silvery gloss; a whitish orbital ring; cheeks, infra-orbital region and malar line slightly spotted with black; throat grey, faintly olivaceous, and dotted with white; remainder of under-surface dull olivaceous, the feathers spotted with short white shaft-streaks; centre of abdomen, vent and under tail-coverts yellowish and spotless; under wing-coverts whitish, barred with grey and tinged with green, especially at edge of wing; bill pale horn-colour; feet whitish; irides brownish-red. Female slightly smaller and duller, and probably with a shorter wing. Hab., New South Wales, extending to the Wide Bay district in Eastern Australia. (Sharpe.)

Gould observes ("Handbook of Birds of Australia," Vol. I., pp. 446-447):—"So far as our knowledge extends, this species is only found in New South Wales, where it inhabits the luxuriant forests that extend along the eastern coast between the mountain ranges and the sea; those of Illawarra, the Hunter, the MacLeay, and the Clarence, and the cedar brushes of the Liverpool range being, among many others, localities in which it may be found; situations suitable to the Regent- and Satin-bird are equally adapted to the habits of the Cat-bird, and I have not infrequently seen them all three feeding together on the same tree. The wild fig, and the native cherry, when in season, afford an abundant supply. So rarely does it take insects that I do not recollect ever finding any remains in the stomachs of those specimens I dissected. In its disposition it is neither a shy nor a wary bird, little caution being required to approach it, either while feeding or while perched upon the lofty branches of the trees. It is at such times that its loud, harsh, and extraordinary note is heard, a note which differs so much from that of all other birds, that having been once heard it can never be mistaken. In comparing it to the nightly concerts of the domestic cat I conceive that I am conveying to my readers a more perfect idea of the note of this species than could be given by pages of description. The concert is performed either by a pair or several individuals, and nothing more is required than for the hearer to shut his eyes to the neighbouring foliage to fancy himself surrounded by London grimalkins of housetop celebrity."

In A. J. Campbell's "Nests and Eggs of Australian Birds," pp. 197-198, we read:—"The first authenticated finds of Cat-birds' eggs were by Mr. Henry R. Elvery, Richmond River (1881), and by my venerable friend Mr. Hermann Lau, South Queensland (1886). These finds were not reported at the time, and the credit fell to Mr. W. J. Grime for a nest and egg which he procured in the Tweed River district, and forwarded to the Australian Museum. The following is Mr. Grime's account, as given in the records of that institution:—"On the 4th October, 1890, I was out looking for nests, accompanied by a boy. I left him for a little while to go further in the scrub, and on my return he informed me he had found a Cat-bird's nest with two eggs, one of which he showed me, the other one he broke descending the tree. I went with him to the nest, and found the old birds very savage, flying at us and fluttering along the ground. The nest was built in a three-pronged fork of a tree, about fourteen feet from the ground. The tree was only four inches in diameter, and was in a jungle of light scrub, about fifty yards from the edge of open country. I felled the tree and secured the nest." Mr. Campbell quotes the following from Mr. Lau's manuscript:—"It was in November, 1886, at Cunningham's Gap, where I happily found a nest five feet from the ground, between the triple fork of a young tree, and an exquisite nest it was. Half-way up from the bottom consisted of dry fig-leaves, beautifully fastened with twining rootlets, and stronger ones from the rim, and lined with dry grass and roots. Finding only one egg in it, I waited for two days more, when there were two. I concluded such to be the clutch. Although it is said that the Cat-bird makes a bower, I never saw one of its own, but several times have seen it poking about the bower of the Satin-bird." "Breeding months include from about the middle of September to January."

"*Eggs.*—Clutch, two to three; shape inclined to oval; texture of shell somewhat fine; surface glossy, and of a uniform rich or dark creamy colour. Dimensions in inches of a full clutch: (1) 1.76 × 1.24, (2) 1.75 × 1.23, (3) 1.72 × 1.23; of a pair, (1) 1.69 × 1.2, (2) 1.68 × 1.18."

Russ says: "In the year 1879 an example reached the Zoological Gardens of London, and in the year 1895 Miss Hagenbeck brought one to the exhibition of the 'Ornis' Society in Berlin."

Spotted Bower-bird (*Chlamydodera maculata*).

Above dark brown, each feather with a sub-terminal spot of tawny buff paler externally; nape crossed by a band of elongated rosy-lilac feathers, forming a broad, fan-like crest; hind-neck a uniform brown; nights pale brown edged with whity-brown, and with terminal spots, ill-defined and whiter on the primaries; upper tail-coverts with sub-terminal and terminal tawny buff bars; tail pale brown with paler edges and buff whitish tips; crown and sides of head with the tawny buff spots much reduced, owing to the dark borders to the feathers, a few of them on the crown tipped with silvery whitish; cheeks with whitish spots; throat brown, with small dusky bars, each feather tipped with pale buff; these become larger on the chest, which is of a general whity-brown tint; breast and abdomen creamy buff; sides whitish, with dusky bars on flanks and thighs; under tail-coverts pale buff, indistinctly barred; flights ashy brownish below, pale yellow along inner webs; bill and feet dusky-brown; irides dark brown; bare skin at corner of mouth thick, fleshy, prominent, and of a pink flesh colour. (Gould.) Female without the lilacine band of elongated feathers on the nape; she is also a trifle smaller, and has ill-defined bars on the under parts. Hab., "Eastern Australia from Rockingham Bay to the Wide Bay district, and occurs also in the interior province and Victoria." (Sharpe.)

Gould observes ("Handbook," Vol. I., pp. 450, 451) that "the bird is seldom seen by ordinary travellers, and

it must be under very peculiar circumstances that it can be approached sufficiently close to observe its colours. The Spotted Bower-bird has a harsh, grating, scolding note, which is generally uttered when its haunts are intruded on, and by which means its presence is detected when it would otherwise escape observation. When disturbed it takes to the topmost branches of the loftiest trees, and frequently flies off to another neighbourhood.

"In many of its actions and in the greater part of its economy much similarity exists between this species and the Satin Bower-bird, particularly in the curious habit of constructing an artificial bower or playing-place. I was so far fortunate as to discover several of these bowers during my journey in the interior, the finest of which I succeeded in bringing to England. It is now in the British Museum. The situations of these runs or bowers are much varied. I found them both on the plains studded with Myalls (*Acacia pendula*) and other small trees, and in the brushes clothing the lower hills. They are considerably longer and more avenue-like than those of the Satin Bower-bird, being in many instances three feet in length. They are outwardly built of twigs, and beautifully lined with tall grasses, so disposed that their heads nearly meet. The decorations are very profuse, and consist of bivalve shells, crania of small mammalia, and other bones bleached by exposure to the rays of the sun or from the camp-fires of the natives. Evident indications of high instinct are manifest throughout the whole of the bower and decorations formed by this species, particularly in the manner in which the stones are placed within the bower, apparently to keep the grasses with which it is lined fixed firmly in their places. These stones diverge from the mouth of the run on each side so as to form little paths, while the immense collection of decorative materials is placed in a heap before the entrance of the avenue, the arrangement being the same at both ends. In some of the larger bowers, which had evidently been resorted to for many years, I have seen half a bushel of bones, shells, etc., at each of the entrances. I frequently found these structures at a considerable distance from the rivers, from the borders of which they could alone have procured the shells and small, round, pebbly stones. Their collection and transportation must therefore be a task of great labour. I fully ascertained that these runs, like those of the Satin Bower-bird, formed the rendezvous of many individuals, for, after secreting myself for a short space of time near one of them, I killed two males which I had previously seen running through the avenue."

According to Gould a nest found by Mr. Charles Coxen, of Brisbane, was built in one of the *Myrtaceæ* overhanging a water-hole, near a scrub, on which a bower was built, and was in form very similar to that of the Common Thrush of Europe; but Mr. Campbell, speaking of a nest which he found, says:—"The nest was loosely composed of sticks and twigs, and lined inside with finer twigs and grass, and contained one fresh egg, the most remarkable for beauty and the wonderful character of its markings that it has ever been my fortune to find." He thus describes the nest and eggs of this species in detail ("Nests and Eggs of Australian Birds," pp. 198, 199):—

"*Nest.*—Flat, somewhat concave; loosely constructed of dead twigs or fine sticks; lined inside with finer twigs and grass; usually situated in a thick bush or tree in open forest country. Sometimes the nest is so frail that the contents may be seen through the structure from underneath. Dimensions over all of a good nest 9 in. to 10 in., by 6 in. in depth; egg cavity 4 in. across by 2 in. deep.

"*Eggs.*—Clutch two, occasionally three; shape inclined to oval, or long oval; texture of shell fine; surface slightly glossy; ground colour light greenish-yellow. There are three distinct characters of markings: firstly, light greyish blotches appearing on the inner surface of the shell; secondly, small stripes or hair-like lines of light sienna and umber, as if painted with a camel-hair brush, in every shape and size round the shell, principally zigzagged latitudinally, but often taking longitudinal and other directions; and, lastly, over these a few darker and heavier stripes and smudges of umber. Both ends of the eggs are comparatively free from markings. Dimensions in inches of a proper clutch: (1) 1.64 × 1.04, (2) 1.63 × 1.05, (3) 1.55 × 1.04; a pair with more of the yellowish-white ground, and with both ends much freer from markings, measures (1) 1.57 × 1.06, (2) 1.5 × 1.07."

A coloured figure of the egg is given on Plate IX. of Mr. Campbell's work. It somewhat reminds one of some varieties of the eggs of our Common Bunting in colour and markings, but is, of course, considerably larger, and perhaps the markings are more massed round the middle of the egg than in any variations of the egg of our familiar friend.

Dr. Russ says that a specimen reached the Amsterdam Zoological Gardens in 1870. In 1880 the late Mr. Abrahams received a female, and a month later showed it to Mr. A. D. Bartlett at the London Gardens, and he expressed the opinion that it would not live another eight days, but Mr. Abrahams not only succeeded in keeping it alive, but taught it to talk, its first word being "Joe," the abbreviation of Mr. Abrahams' name, which the bird often heard Mrs. Abrahams use. Later it learned to say "pretty boy," then it mixed up the two and said "pretty Joe." The next accomplishment was to mew like a cat and bark like a dog, and when asked "Where is the cat?" or if the words "Puss, puss!" were spoken, the bird would immediately begin to mew. Two years later Mr. Bartlett paid a visit to Mr. Abrahams, and expressed his delight at the hardiness of the bird, and asked to purchase it for the Gardens, so Mr. Abrahams sold it to him at what he considered a reasonable price. In 1882 he received a male, which also found its way to the Gardens. The pair built many nests, but no eggs appear to have been deposited. In 1888 Mr. Abrahams again received a pair of this species, but it is undoubtedly rare in the market. Mr. Phillipps has possessed it.

Great Bower-bird (*Chlamydodera nuchalis*).

Above grey-brown, the edges of the feathers being greyish; the upper tail-coverts also have a sub-terminal whitish spot; flights darker margined with ashy and tipped with whitish; tail feathers similar, but with the tips barred with whitish; feathers of head lustrous, and with a minute whitish tip; a rosy lilac band on the nape, partly encircled by a ruff of silvery tipped brown feathers; hind-neck unspotted; sides of head and under surface sandy greyish, browner on flanks and thighs, which are obscurely barred; centre of abdomen and under tail-coverts pale cream-whitish; under wing-coverts and axillaries grey-brownish indistinctly barred; bill, feet, and irides brownish. Female smaller and without lilac band on nape. Hab., Northern Australia, from Port Darling and Port Essington to the north-western district. (Sharpe.) Like the preceding species this bird also constructs a bower, which it ornaments with shells, etc.

Mr. D. Le Souef (*The Ibis*, 1899, pp. 359, 360) says:—"Their bowers are large, being formed of twigs and arched over at the top, and are from two to three feet long, the passage through being about 9 in. wide, and

the width of the sides of the bower about 6 in. At both ends was the usual collection of land shells, pebbles, small bones, seeds, coloured feathers, etc. At one bower of these birds found on the Victoria River, N.W. Australia, and about 100 miles from the coast, were several turtle bones. The birds were frequently re-arranging the position of their collections. Three nests were found; each had a single egg in it, but the full clutch is probably two. The nests were built about 15 ft. from the ground, on what is locally called an 'ironwood' tree, in the open forest, and were situated near the end of the branch, one being in a bunch of mistletoe. They are open and lightly built of twigs, without any lining, and measure—external depth 5 in., internal 2 in.; external diameter 8 in., internal 4 in. The eggs are very similar in appearance to those of *C. orientalis* and *C. maculata*, but not quite so handsomely marked. The one taken on December 18th, 1898, has the ground colour of a very light shade of green, and is well marked all over with short, irregular, wavy lines and blotches of a greenish-brown tint in varying shades; many of these appear as if beneath the surface of the shell, being of a lilac colour, and many of them are longer than the surface markings. The shell is slightly glossy and elongated in form, and a little smaller at one end. It measures 1.78 × 1.16 in. The three eggs taken vary in size and markings."

Dr. Russ says that an example of this Bower-bird was exhibited by Mr. G. Reisz, in 1894, at the show of the Ægintha Society in Berlin. This would appear to be the only recorded instance of its importation, but, of course, there is nothing to prevent its turning up in any consignment of North Australian birds.

REGENT-BIRD (*Sericulus melinus*).

Head, neck, and front of mantle bright cadmium yellow, more orange on the crown; lower mantle, back, wing-coverts, first two primaries, and tail black; remaining quills cadmium yellow tipped with black, excepting innermost secondaries, the primaries also partly black on inner web; sides of head and under surface black; greater under wing-coverts yellow; bill yellow; feet black; irides pale yellow. Female, above brown; the feathers of mantle and back white-centred and black-edged; the innermost secondaries with a white spot at tip; forehead pale brown with dark tips to the feathers; hind-crown and back of head black; sides of head and nape reddish-brown, with dusky edges to the feathers; hind-neck whitish, with dusky edges to the feathers, and succeeded by a black patch on lower hind-neck; base of forehead and lores buffy-whitish; chin and sides of throat pale reddish; centre and hind-throat black; rest of under-surface whity-brown; the feathers of breast and sides of body, under wing-coverts, and axillaries with blackish edges; thighs and under tail-coverts reddish-brown; flights below brown, with rufescent inner webs; bill and feet black; irides brown. Hab., New South Wales, along the east coast of Australia as high as the Wide Bay district and Port Denison. (Sharpe.)

A young bird bred by Mr. Reginald Phillipps was sent to me for description. The following, which appeared in his important article on the species (*The Avicultural Magazine*, Second Series, Vol. IV., p. 128), is what I made of it: "Head whity-brown with a broad blackish horse-shoe marking, its opening in front, on the crown; a short blackish bar runs from the back of this marking to the back of each eye; nape covered with tiny ashy-whitish feathers; bill dull pitchy blackish, with flattish, oval, ochre-yellow patch at base of gape. Upper parts, including wings and tail, deep bronze-brown; the feathers of the mantle white, broadly bordered with brown, those of the lower back and rump broadly barred with ashy-white; under parts ashy-white, each feather with a narrow sub-terminal grey bar; feet leaden-greyish, the metatarsi pale, and washed, especially at the back, with sulphur-yellow; digits flesh-pink at back, small for size of bird, claws black. Total length about 7 in." An illustration of the top of the head is given on p. 127.

Gould ("Handbook," Vol. I., p. 460) quotes the following description by Mr. C. Coxen of the bower of the Regent-bird:—"The bower of the Regent-bird differs from the Satin-bird's in being less dome-shaped, straighter in the sides, platform much less, being only ten in. by ten in., but thicker in proportion to its area, twigs smaller and not so arched, and the inside of the bower smaller; indeed, I believe, too small to admit an adult Satin-bird without injury to its architecture. The decorations of the bower are uniform, consisting only of a small species of helix, herein forming a marked distinction from the Satin-bird."

"Its food consists of berries, wild fruits, and insects. In confinement it greedily disposes of house-flies, cock-roaches, and small insects, showing great activity in their capture; but its principal food is the banana, of which it eats largely."

Mr. A. J. Campbell was the first to receive eggs, and later a nest with eggs, of the Regent-bird. They are thus described in his splendid work "Nests and Eggs of Australian Birds," pp. 208, 209:—"*Nest.*—Flat, slightly concave; loosely constructed of coarse twigs or dead branchlets lined on top with fine brownish twigs and long, yellowish, wire-like stems of a climbing plant, the latter being chiefly placed round the side; usually situated in dense scrub, at a height of from 12 ft. to 25 ft. from the ground. Dimensions over all, 12 in. long by 6 in. broad and 2 in. thick.

"*Eggs.*—Clutch two, sometimes three. In a clutch of two (1) is a beautiful, well-shaped specimen, with texture of shell fine and surface slightly glossy; colour light yellowish-stone, with a faint greenish tinge, marked with blotches and spots of sienna or olive-brown, but chiefly with remarkable hair-like markings of the same colour, as if a person had painted on the shell fanciful shape and figures with a fine brush. Intermingled are a few dull greyish streaks. All the markings are fairly distributed, being more abundant round the upper quarter; (2) is similar to the other specimen, but markings are less pronounced and finer in character, with a greater proportion of dull greyish hair-like streaks. Dimensions in inches: (1) 1.57 × 1.1, (2) 1.55 × 1.07."

An illustration is published of the nest and eggs. Mr. Phillipps' excellent paper on the breeding of this species in captivity (*The Avicultural Magazine*, New Series, Vol. IV., pp. 51, 88, and 123) should be studied.

PARADISE BIRDS (*Paradiscidæ*).

The late Professor Newton, in his valuable work "A Dictionary of Birds," observes that "the *Paradiscidæ* are admittedly true *Passeres*, but their exact position cannot be said to have been absolutely determined, though there can be little doubt of their forming part of the group indefinitely known as 'Austrocoraces.'" Gould, as already stated, considered the Bower-birds to be very nearly allied to them, in which he was probably right. In the "Museum Catalogue of Birds," although widely sundered from the Bower-birds, they are placed next to the Crows. If, then, we place them between the two groups I do not think we can go far wrong.

These birds lay very singularly marked eggs, with parallel longitudinal streaks radiating from the larger end, which give them rather an artificial appearance.

Of late years, through the energy of several wealthy members of the Avicultural Society, a considerable importation of Paradise Birds has been effected, so that this work would be very defective if the family were to be omitted. Russ, of course, includes it in his work.

Rifle-bird (*Ptilorhis paradisea*).

Velvet black, glossed above, on the sides of the neck, chin, and breast with plum colour; tips of flights and whole of secondaries glossed with violet; two central tail-feathers glossy steel-green; the next on each side with steel-blue towards the base; crown and throat glossy bronzy-green; feathers of hind-neck fringed with steel-blue; a patch of velvety purple above the ear-coverts; sides of head with a purplish gloss; breast velvety purple, bluer at centre of feathers, hind-breast with olive-green edges to the feathers; rest of body below olive-green, cupreous plum colour at base of feathers; under-wing and tail-coverts black; bill and feet black. Female, above greyish-brown washed with olive; head and sides of neck dark brown with greyer streaks; wing-feathers with ferruginous edges; a buff eyebrow stripe; chin and throat pale buff; remainder of body below deep tawny buff transversely spotted with brown, which increases to irregular bars on the flanks; quills below brown, somewhat olivaceous externally and shading into tawny buff at the edges; tail very similar. Hab., South-eastern Australia, ranging as far north as Queensland. (Sharpe.)

Gould quotes the following observations by the late Mr. F. Strange ("Handbook," Vol. I., p. 592) :—"The principal resort of the Rifle-bird is among the large cedar-brushes that skirt the mountains and creeks of the Manning, Hastings, MacLeay, Bellenger, Clarence, and Richmond Rivers, and there, during the pairing months of November and December, the male bird is easily found. At that time of the year, as soon as the sun's rays gild the tops of the trees, up goes the Rifle-bird from the thickets below to the higher branches of the pines (*Araucaria macleayana*) which there abound. It always affects a situation where three or four of these trees occur about two hundred yards apart, and there the morning is spent in short flights from tree to tree, in sunning and preening its feathers, and in uttering its song each time it leaves one tree for another. The sound emitted resembles a prolonged utterance of the word "Yass," by which the bird is known to the natives of the Richmond River. In passing from tree to tree it also makes an extraordinary noise resembling the shaking of a piece of new stiff silk. After 10 a.m. it descends lower down, and then mostly resorts to the thick limb of a cedar tree (*Cedrela australis*), and there continues to utter its cry of *yass* at intervals of two minutes' duration. At this time, owing to the thickness of the limb and the closeness with which the bird keeps to it, it is very difficult of detection; wait with patience, however, and you will soon see him, with wings extended, and his head thrown on his back, whirling round and round, first one way and then another.'

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," pp. 66, 67) thus describes the nest and eggs of this bird :—"*Nest.*—Somewhat bulky, outwardly constructed chiefly of green stems and fronds of a climbing fern (*Polypodium confluens*), with a few other broad dead leaves at the base, ornamented round the rim with portions of shed skins from the carpet snake (*Morelia variegata*), lined inside with wire-like rootlets and a few straight portions of twigs. Dimensions over all, eight inches to nine inches, by four inches in depth; egg cavity, four inches across by two inches deep.

"*Eggs.*—Clutch, two; in shape, inclined to oval, but more swollen about the upper quarter; shell, somewhat fine in texture, surface somewhat uneven, *i.e.*, with hair-like tracks or creases, but glossy; colour, rich fleshy tint or pinkish buff, moderately but boldly marked or streaked longitudinally with reddish-brown and purplish-brown, the markings being more numerous on the apex and upper quarter. Some of the markings have the appearance of being painted on with a fine brush. . . . Dimensions in inches, 1.29 × .98."

When Mr. Campbell speaks of "the apex" of an egg he means the large (not the more pointed) end. He gives a coloured illustration of the egg on Plate 6, which shows the usual distinctive characteristics of the eggs of Paradise-birds.

Russ says that this species has only been once imported alive to Europe, an example having arrived at the London Zoological Gardens in April, 1882. I do not know whether others have since come to hand.

Twelve-wired Bird of Paradise (*Seleucides niger*).

Velvety-black; above glossed with green and coppery; greater coverts and secondaries bright plum colour; primaries glossed with violet externally; tail bright plum colour; head above cupreous purple, green at the sides and on throat; fore-neck and chest somewhat green in the centre, the lateral plumes fringed with metallic emerald green; rest of under-surface buff yellow; flank plumes elongated, silky, with six bristle-like elongated shafts curving backwards on the body from each side; under wing-coverts black; bill black. Female, above chestnut-red; back and sides of neck black; mantle mottled with black; primaries black, chestnut on outer webs; crown and nape velvet-black, glossed with purple; orbital space and a spot on the ear-coverts bare, the latter otherwise black; sides of face and throat greyish-white, indistinctly barred with blackish; remainder of under-surface sandy brown, rufescent here and there, and irregularly barred throughout with blackish-brown, less distinctly on abdomen, long flank-feathers and under tail-coverts; under wing-coverts bright chestnut, barred with blackish. Hab., New Guinea.

An inhabitant of the moist plains near the coast, this species frequents flowering trees, upon the nectar from the blossoms of which Wallace seems to have concluded that it chiefly lived, that alone being found in the crops of examples which he obtained; but he adds that it doubtless also feeds upon fruit and insects, as a specimen which he saw alive on a Dutch steamer accepted greedily both moths and melon.* According to Rosenberg this species occurs in small companies or families, and when seeking food its cry is a sharp *scheck, scheck*. Dr. A. B. Meyer, however, says that it flies alone or in pairs and cries very loudly in its throat *wau, wau*, with a high sound, with which sound it can be decoyed and easily secured. Rosenberg found fruit and insect remains in the crops of those which he killed, and Meyer says that they eat three times a day, seeking for insects under the bark of trees and also eating fruit.

With regard to the note of this species, A. P. Goodwin says (*The Ibis*, 1890, pp. 150, 151) :—"The Twelve-wired Paradise-bird inhabits the swampy districts near the coast, where it is not easily obtained.

* Not having Wallace's "Naturalist in the Malay Archipelago" by me, I quote the above notes from Russ.

Its call can be heard at a long distance, and is a double note, difficult to imitate, even by the natives."

At the fifty-sixth meeting of the Ornithologists' Club the Hon. Walter Rothschild sent for exhibition an egg of this species. "It had been found in an open nest in a Pandanus swamp on the Vanapa River in British New Guinea, on a Pandanus tree. The nest was a large structure, about ten inches across and six inches high, consisting externally of the Pandanus leaves, then of pieces of rotten wood, and lastly of small twigs, the cup being rather flat and by no means softly lined. The single egg found resembles closely those of other *Paradiscidæ*, and especially those of the genus *Ptilorhis*, being about the size of a Rook's egg, and of a cream colour, with more or less longitudinal rufous-brown and purplish-grey spots, which were most frequent near the thick end. It measured 40 mm. in length, and 22.5 mm. in its broadest diameter." (*The Ibis*, 1899, p. 125.)

Russ observes that a male reached the Zoological Gardens of London in 1881, and specimens were twice represented in the Berlin Gardens. The first lived there more than two months, the second only two weeks. In 1907 Mr. Walter Goodfellow brought home an example for Mrs. Johnstone, of Groombridge.

Great Bird of Paradise (*Paradisea apoda*).

Above rich coffee-brown; head and neck velvety stramineous; a black orbital line; forehead, lores, cheeks, throat, and fore-neck velvety black, glossed with metallic green; remainder of under-surface rich coffee-brown, purplish on breast; two central tail-feathers elongated into long, wire-like shafts; two immense bunches of graceful elongated plumes from the flanks, yellow shading into chocolate on outer third and terminating in white shafts; also several rigid bright yellow plumes, partly tipped with red; bill lead-colour, greenish-white at tip; feet flesh-colour. Female rich coffee-brown, more purplish on head, neck, and chest; nape tinged with stramineous; flank-plumes elongated, but coloured like the body; two central tail-feathers somewhat pointed. Hab., Aru.

Russ quotes the following field-notes (probably from Wallace, but he does not mention the author):—"The Great Bird of Paradise is very lively and vigorous, and appears to be in constant motion during the whole day. It occurs in great abundance; small companies of females and young males are always to be found, and, if the birds in full plumage are somewhat less numerous, yet their loud cry, which one hears daily, reveals the fact that even they are present in plenty. Their note sounds like Wawk-wawk-wawk-wok, wok-wok, and it is so loud and shrill that it can be heard at a great distance, and constitutes the most familiar and striking animal sound in the Aru Islands. The nidification is still unknown, but the natives told me that the nest of leaves is placed on an ants' nest or on a projecting branch of a very high tree, and they believe that it only contains a single young bird. The egg is entirely unknown, and the natives assert that they have never seen it. A very high reward offered by a Dutch officer for an egg was without result. They moult in January and February. In May, when they are in full beauty of plumage, the males assemble early in the morning in order, as the natives assert, to carry out their 'sacalili,' or dancing-parties; these take place on certain forest trees, which are not fruit trees, but have widely-spreading boughs and large divergent leaves, which give the birds space for sporting and displaying their plumage. A dozen to twenty fine-feathered birds collect together on a single tree, raise their wings, stretch out their necks, and erect their splendid plumes, which they keep in continual quivering motion. Meanwhile they fly in great excitement from bough to bough, so that the whole tree is filled with waving plumes in great variety of position and motion. When the Paradise-bird is thus seen it indeed deserves its name, and must be reckoned among the most beautiful and wonderful forms of life. This habit gives the natives an opportunity of securing the creatures with little trouble. As soon as they see that the Paradise-birds have chosen a tree upon which to assemble, they build a little bower of palm leaves at a suitable place under the branches, and the hunter conceals himself below them before daybreak, armed with his bow and a number of arrows terminating in a round knob. A boy waits at the foot of the tree, and when the birds arrive at sunrise, and a sufficient number have assembled and begun to dance, the hunter shoots off his blunt arrow so strongly that a bird falls down stunned, and is either captured or killed by the boy, without a drop of blood being sprinkled on the plumage. The other birds appear not to take any notice of this, and fall down one after another, until at last some of them become alarmed."

The egg of this species, having the usual streaky, vegetable-marrow-like character, was secured by Mr. Charles Pratt, and is described and figured by Mr. Collingwood Ingram in *The Avicultural Magazine*, New Series, Vol. V., p. 364. The ground-colour is cream, and the streaks at the larger end consist of lavender-grey shell-streaks and Vandyke brown surface streaks; a few smaller streaks or spots of the latter colour are scattered here and there on other parts of the shell. Dr. A. B. Meyer also figured a damaged egg in 1883.

According to Russ, this species was exhibited in the Dresden Zoological Gardens in 1875, and he says that the leading actor, Fritz Schrödter, of Prague, when on a visit to London, in 1884, saw three beautifully-feathered males at our Zoological Gardens, which had been deposited there by a lord, whose property they were. The Society's list mentions one example only, deposited in 1885. I have an indistinct memory of seeing the species myself at our Gardens about that time, but whether there was more than one example or not I could not assert positively at this distance of time. I certainly had the impression that such was the case, but there may have been another species in the flight with it. In 1905 Mrs. Johnstone received one specimen of this beautiful species, and in 1907 Mr. Pratt brought seventeen specimens home, in both sexes, for Sir William Ingram. A large consignment came home in 1909, it being Sir William's intention to turn them out on his estate in Trinidad.

Lesser Bird of Paradise (*Paradisea minor*).

Above rich coffee-brown; mantle and scapulars dull buffish; reddish at base of feathers; least wing-coverts washed with buff; median and greater coverts tipped with bright buff; two central tail-feathers terminating in long, thread-like shafts; crown, back, and sides of neck, the latter tending towards lower throat, bright velvety buff; a frontal band, lores, cheeks, and throat velvety glossy green; forehead, chin, and a spot at base of lower mandible blackish; under-surface from throat backwards rich coffee-brown; two large bunches of graceful elongated plumes from the flanks, their basal half bright yellow and their terminal half white; also a few stiff blood-red plumes; under wing-coverts and inner lining of quills coffee-brown, like the body; bill leaden-grey; feet black. Female coffee-brown; hind neck and mantle dull buff, wing-coverts washed with the same; metallic green of forehead and throat wanting, as also the flank plumes; under surface of body from throat backwards silky white; sides, flanks,

THE KING BIRD OF PARADISE.

and thighs washed with coffee-brown, as well as the outer edge of under wing-coverts. Hab., New Guinea and neighbouring islands.

Russ says that, according to Rosenberg, this species, like all members of its family, is a migratory bird, sometimes occurring on the coast and sometimes in the interior of the country following the ripening of certain tree-fruits. He then quotes Wallace as follows:—"That was just the case during my residence at Dorey with the fruits of a Laurinea which grew upon the summit of a hill about 166 ft. high behind the villages. The birds, chiefly females and young males, came flying with vigorous flapping of wings to these trees; and were so little nervous, that they even returned after they had been shot at several times. Otherwise this bird is uniformly timid and difficult to get a shot at, particularly the old males. Their cry sounds hoarse, can be heard from a long distance, and may be best represented by the words 'wuk, wuk, wuk,' frequently followed by a scratching sound. Morning and evening one hears this cry resounding through the forest, rarely at midday. Constantly in motion, the bird flies from tree to tree, never remains long sitting quietly on the same branch, and at the least noise conceals itself in the thickly foliaged branches of the tree. Even before sunrise the Paradise-birds fly about to seek for their food." *

I have not succeeded in finding any other notes upon the wild life of this species. Mr. Wallace brought home two males for the London Zoological Gardens in 1862; two more were purchased in 1878; Mr. Kettlewell brought home three males in 1884; two received by Mrs. Johnstone in 1904 were deposited at the Gardens in 1905; Mr. Pratt brought one home in 1907; the Amsterdam Gardens secured an example in 1879; an example, which was in the Dresden Gardens in 1875 subsequently was transferred to those of Berlin: altogether a good many examples of this species have been imported.

Red Bird of Paradise (*Paradisea sanguinea*).

Back of head, back and sides of neck (continued as a band across the front of breast), mantle and wing-coverts bright golden buff; the latter, scapulars, and middle of back washed with orange-brown, the general colour of the back being reddish brown, with an orange tinge; rump buff; upper flights, tail-coverts and tail reddish chestnut, the two central tail-feathers represented by long metallic horn-like shafts; front of crown and orbital region, sides of face and throat bright velvety metallic green; the feathers above the eye elongated into a small tuft; lores, feathers in front of eye and chin velvety greenish-black; breast and under wing-coverts dark purplish chestnut, the yellow gorget extending a short way on each side of the upper breast and consisting of stiffened feathers; abdomen and under tail-coverts chestnut rather paler than the breast; two immense bunches of bright crimson plumes with whitish tips from flanks; bill gamboge yellow; irides blackish olivaceous. Female reddish-brown, deeper and more purplish on front of head, sides of face and throat; back of head, entire neck and mantle golden buff shading to orange. Hab., Waigiou, Ghemien and Batanta. Russ observes:—"Wallace heard and saw them tolerably numerously at Waigiou, near to the village of Muka. They were very timid and not easily obtained. Wallace's hunter first shot a female, and the explorer himself one day got very close to a beautiful male: 'The bird crouched low down and ran along a branch searching for insects, almost like a Woodpecker; the long heavy ribbons in the tail hung down in the most graceful double curve. I took aim and intended to use the barrel which contained a very small charge of powder and a No. 8 shot, in order not to injure the plumage, but the weapon missed fire and the bird immediately disappeared into the thicket. Another day I saw no less than eight beautiful males at different times, and fired at them four times; but, although other birds at the same distance almost always fell, they escaped and I began to think that we should not secure this splendid species. At last the fruits on the fig-tree near my house got ripe, many birds came to feed upon them, and one morning while I was taking my coffee, I saw a male Paradise-bird settle near the top of it. I seized my gun, ran under the tree, and, as I looked up, I could see it flying from branch to branch taking a fruit here and another there, but then before I could take satisfactory aim in order to shoot it at such a height (for it was one of the highest trees of its kind) it disappeared into the forest. It now visited this tree every morning, but remained thereon so short a time and its movements were so active and it was so hard to see on account of the lower trees which obstructed the view, that it was only after several days and one or two misses I at last brought down my bird—a male with most splendid plumage.'"

The London Zoological Gardens obtained a male of this species in 1881, and three in 1884. Mr. Goodfellow brought home two in 1907.

King Bird of Paradise (*Cicinnurus regius*).

Above satiny crimson shaded with orange especially on the forehead; flights orange-brown, washed externally with crimson; tail ashy-brown, with crimson or orange edges to the feathers, concealed entirely by the long tail-coverts, the two central feathers elongated into a long wire-like shaft, terminating in a spiral disc of metallic green; a spot of black feathers shot with green above the eye; throat and foreneck purplish-crimson, the lower feathers with orange-buff tips, forming a band across the foreneck, followed on breast by a metallic green belt; from each side of the breast a tuft of long ashy-brown plumes with green tips, a subterminal buff line and a second narrow reddish brown line; remainder of under surface pure white; bill apparently yellow and feet blue.* Female above brown, tinted especially on the head, with olivaceous or golden; greater coverts and flights darker, washed externally with reddish orange; tail brown, faintly glossed with golden; sides of head and throat dusky, with small central buffish shaft-streaks to the feathers; rest of under surface pale buff, more golden on foreneck and barred throughout with dull brown; under wing-coverts and axillaries reddish with ill-defined brown bars; edge of wing orange cadmium. Hab., New Guinea and Salwatti, Aru, Mysol and Jobi.

In May, 1897, Mr. Walter Goodfellow brought home several pairs of this gorgeous bird for Mrs. Johnstone and Mr. Charles Pratt brought from Aru two males and one female for Sir William Ingram. The latter gentleman has described and illustrated the display of this Bird of Paradise (*The Ibis*, 1907, pp. 225-229). He says:—"He always commences his display by giving forth several short separate notes and squeaks, sometimes resembling the call of a Quail, sometimes the whine of a pet dog. Next he spreads out his wings,

* In *The Ibis* for 1905, pages 429-440, Mr. W. R. O. Grant has published a full and liberally illustrated account of the display of this species.

* See Sir William Ingram's illustration (*The Ibis*, 1907, Plate V.).

occasionally quite hiding his head; at times, stretched upright, he flaps them, as if he intended to take flight, and then, with a sudden movement, gives himself a half-turn so that he faces the spectators, puffing out his silky-white lower feathers. Now he bursts into his beautiful melodious warbling song, so enchanting to hear, but so difficult to describe. Some weeks ago I was crossing a meadow and heard the song of a Skylark high up in the heavens and I exclaimed at once, 'That is the love-chant of my King Bird.' He sings with a low bubbling note, displaying all the while his beautiful fan-like side plumes, which he opens and closes, in time with the variations of his song. These fan-plumes can only be expanded when his wings are closed, and during this part of the display he closes his wings and spreads out his short tail, pressing it close over his back, so as to throw the long tail-wires over his head, while he gently swings his body from side to side. The spiral tips of the wires look like small balls of burnished green metal, and the swaying movement gives them the effect of being slowly tossed from one side to the other, so that I have named this part of the display the 'juggling.' The swaying of the body seems to keep time with the song, and at intervals, with a swallowing movement of his throat, the bird raises and lowers his head. Then comes the finale, which lasts only for a few seconds. He suddenly turns right round and shows his back, the white fluffy feathers under the tail bristling in his excitement; he bends down on the perch in the attitude of a fighting cock, his widely opened bill showing distinctly the extraordinary light apple-green colour of the gullet, and sings the same gurgling notes without once closing his bill, and with a slow dying away movement of his tail and body. A single drawn-out note is then uttered, the tail and wires are lowered, and the dance and song are over.

"The King Bird has another form of display which he very rarely exhibits, and only on three or four occasions have I seen him go through this performance. Dropping under the perch the bird walks backwards and forwards in an inverted position with his wings expanded. Suddenly he closes his wings and lets his body fall straight downwards, looking exactly like a crimson pear, his blue legs being stretched out to their full length, and his feet clinging to the perch. The effect is very curious and weird, and the performance is so like that of an acrobat suddenly dropping on to his toes on the cross-bar of a trapeze that I have named this 'acrobatic' display. It has been witnessed on different days to his 'juggling' display. While giving his acrobatic performance he sings the whole time, but never shows his side plumes; and when he is in the pendulous position his body sways gently as if it were influenced by a fitful breeze. The whole of this performance takes but a very few seconds."

It has often been incorrectly asserted, and Darwin has repeated the error in his "Descent of Man," that "the power of song and brilliant colours have rarely been both acquired by the males of the same species." To those who have kept a great many species, it is well known that many of the most gorgeously coloured birds sing remarkably well: amongst the Thrushes the Blue Rock-Thrush is one of the finest songsters, Leiothrix is a notoriously grand songster, several of the gorgeous Tanagers sing sweetly, the flaming Virginian Cardinal is an acknowledged vocalist of merit, and many of the brightly coloured Finches sing excellently; the *Icteridæ* (with their startling contrasts of yellow, orange, scarlet with black and white) number not a few fine singers in their ranks, the Fruit-suckers of the East (*Chloropsis*) are fine performers, and here we have one of the most brilliant of all living birds—the King Bird of Paradise—gifted with a love-chant not unlike that of the Skylark. On the other hand many sombrely coloured birds are poor performers, and I regard the vocal ability of our Song Thrush as very inferior to that of our far more attractively coloured Blackbird. The notion has probably arisen from the fact that the Nightingale is modestly coloured but a prince of songsters, and it has been assumed that vocal power has been given as a compensation for loss of colour, but that is all poetical fiction.

[The Calendar issued with *Canary and Cage-Bird Life*, 1910, depicted the Marquis Raggi, Greater, Blue, and King Birds of Paradise.—Ed.]

Green Manucode (*Manucodia chalybata*).

General colour above rich purple, the inner webs of flights and tail-feathers blackish; the outer wing-coverts washed with steel-blackish; nape, hind-neck, and mantle slightly tinted with steel-greenish; sides of face and neck dark green; all the feathers of the head close-set and velvety; feathers of chin, throat, and fore-neck to sides of neck glossy golden green, crinkled and curled; rest of under-surface deep purple, a few of the abdominal feathers slightly glossed with greenish; under wing-coverts black; the outer edge of wing washed with green; bill and feet black. Female not differentiated. Hab., N.W. New Guinea. I have failed to discover any field-notes relating to this species. An example reached the London Zoological Gardens in March, 1881, and, according to Dr. Russ, this is the only instance in which it has been imported.

CHAPTER IV.

CROW-LIKE BIRDS (*Corvidæ*).*

(Sub-family *Corvinæ*).

Large-billed Crow (*Corvus culminatus*).

Above steely black; the crown, back, wing-coverts, secondaries, and outer webs of tail feathers glossed with violet; primary-coverts, false wing, outer webs of primaries, inner webs of secondaries and tail-feathers, and sides of face and neck glossed with steel-green; under surface of body blue-black with slight violet reflections; throat-feathers somewhat lanceolate, greenish-black shading into purplish on lower throat; bill and feet black. Female not differentiated, but probably with a shorter bill than the male. Hab., Indian peninsula.

Jerdon ("Birds of India," Vol. II., p. 297) says:—"It is gregarious, feeds on offal and carrion; its flight is strong and rapid, and it is often seen tormenting kites and other large birds. It is familiar in its habits, and is generally seen feeding in villages or around the hill stations; is abundant on the mountains round the valley of Cashmere, and, eastward, on the ranges near the stations of Dugshai and Simla, also on the lesser Himalayan ranges." Hume says ("Nests and Eggs of Indian Birds," Vol. I., pp. 4, 718):—"March to May is, I consider, the normal breeding season; in the plains the majority lay in April, rarely later, and in the hills in May; but in the plains a few birds lay also in February.

* The Crow-like Birds in captivity should have a good insectivorous soft food as staple diet, to which fruit, nuts, insects, mice, small birds, eggs, small fish, newts, tadpoles or small frogs may be added as variety.

"The nest is placed, as a rule, on good-sized trees, and pretty near their summits. In the plains mangos and tamarinds seem to be preferred, but I have found the nests on many different kinds of trees. The nest is large, circular, and composed of moderate-sized twigs; sometimes it is thick, massive, and compact; sometimes loose and straggling; always with a considerable depression in the centre, which is smoothly lined with large quantities of horsehair or other stiff hair, grass, grass-roots, cocoanut fibre, etc. In the hills they use any animal's hair or fur, if the latter is pretty stiff. They do not, according to my experience, affect luxuries in the way of soft down; it is always something moderately stiff, of the coir or horsehair type, nothing soft and fluffy. Coarse human hair, such as some of our native fellow-subjects can boast of, is often taken, when it can be got, in lieu of horsehair.

"They lay four or five eggs. I have quite as often found the latter as the former number. I have never myself seen six eggs in one nest, but I have heard, on good authority, of six eggs being found.

"The eggs, though smaller, closely resemble, as might have been expected, those of the Raven, but they are, I think, typically somewhat broader and shorter. Almost every variety, as far as coloration goes, to be found amongst those of the Raven, is found amongst the eggs of the present species, and *vice versâ;* and for a description of those it is only necessary to refer to the account of the former species.

"The average of thirty Himalayan eggs is 1.73×1.18, of twenty Plains eggs 1.74×1.2, and of fifteen Nilghiri eggs 1.7×1.18. I would venture to predict that with fifty of each there would not be a hundredth of an inch between their averages."

A specimen of this Crow reached the London Zoological Gardens in 1873, and another in 1877.

White-necked Crow (*Corous scapulatus*).

Above purplish-black, with steel-blue reflections; hind neck, mantle, sides of neck, and breast pure white; feathers of lower throat white at base; abdomen and under wing-coverts black, excepting the innermost axillaries, which are white; bill and feet black; irides hazel. Female perhaps a trifle smaller and duller, and with a shorter and heavier bill. Hab., Africa south of the Sahara and Madagascar.

Dr. Stark says ("Birds of South Africa," Vol. I., pp. 13, 14) :—"It usually occurs in pairs, occasionally in small flocks. Like most of its tribe, it is omnivorous in its diet; at the same time, it shows a decided partiality for animal food, and is always on the look-out for carrion and offal of all sorts. In the neighbourhood of towns it is a hunter of slaughter-houses and refuse heaps, in the country it visits camps and outspans in search of scraps of meat or bones that may be thrown on one side. On the coast it visits the beach, turns over the seaweeds, picks up shell-fish, or feeds on dead fish or whales left by the tide. At other times it visits cattle or wild animals and frees them of various insect pests. There is, indeed, very little that this Crow will not eat.

"Its usual note is a harsh croak, but, like many of the Crows, it has a singular variety of cries, especially in spring, many of them sounding as if the bird were about to choke or was trying to call with its mouth full of food.

"The nest, built in September in Cape Colony, is a large basket-work of sticks and twigs lined with wool and other soft material. It is usually placed in a tree, but occasionally on the ledge of a krantz. The eggs, from four to six in number, are bluish-green, spotted and streaked, especially towards the larger end, with different shades of olive-brown. They measure 1.65×1.15."

The London Zoological Society acquired a specimen in 1865, three in 1866, and three in 1874, from which date they continued to arrive fairly frequently.

White-necked Raven (*Corvultur albicollis*).

Shining black; inner secondaries slightly brownish head somewhat purplish; a broad white collar on back of neck; throat and upper chest dull brown, an ill-defined whitish band across lower throat; bill blackish-brown, with whitish-horn tips to the mandibles; feet blackish brown; irides hazel. Female not differentiated, but probably a trifle smaller and with shorter bill. Hab., South Africa.

Dr. Stark ("Birds of South Africa," Vol. I., pp. 11, 12) observes :—"Found alike on the coast, among the mountains and on the high veldt, as well as in the Karroo and the sandy wastes of Namaqualand, the 'Ring-hals' is one of the most widely distributed and best known birds of South Africa. Where not molested it is a bold and fearless species, frequenting the outskirts of towns and villages, and the vicinity of farm-houses, native kraals and outspans, on the look-out for offal and scraps of all kinds. When reared from the nest it makes an extremely tame and amusing, if somewhat mischievous, pet; it has, in fact, all the habits and idiosyncrasies of the European Raven. Its ordinary cry, also, a harsh croak, is, to my ear, exactly similar to that of the latter bird.

"In the interior the 'Ring-hals' feeds largely on carrion, and is usually the first bird to detect a carcase. On the coast it devours dead fish cast up by the waves, shell-fish of all kinds, the paper-nautilus being a favourite tit-bit, as well as the eggs of penguins and other sea fowl. At times it kills and eats snakes, lizards, frogs, and small tortoises. Nor does it disdain an insect diet; beetles, grasshoppers, locusts, and termites are all readily devoured, as well as ticks and bots picked from the hides of cattle. I have sometimes amused myself by watching the bold yet cautious and gentle manner in which one of these Ravens will approach a reclining ox, and after a preliminary course of soothing caresses, accompanied by a soft 'cawing' note, insert his head into the ear and dexterously extract the ticks. These birds always seem to have a good understanding with the older and more experienced oxen, who will, at a hint from one of them, lie down and place themselves in the most favourable position for the extraction of their parasites.

"The 'Ring-hals' is usually a resident in Cape Colony and Natal, and roosts all the year round in or near its nest. This latter is invariably, so far as I have observed, built on a rock or krantz, on a ledge or in a hole. It is large, and firmly constructed of dead sticks and twigs mixed with pieces of turf and tufts of grass, and is lined with rootlets, wool, hair, grass, and various soft material. The eggs, almost invariably three in number, vary considerably in colour and shape, even in the same nest; they are of some shade of bluish-white, more or less thickly marked with various shades of olive-brown, and are not to be distinguished with certainty from eggs of the European Raven (*Corvus corax*). They average 2.05×1.32.

"The same nest is occupied year after year. In the neighbourhood of Cape Town the eggs are usually laid in August."

A specimen of this species was presented to the Zoological Gardens of London by Mr. Marshall in January, 1890. Dr. Russ describes the Thick-billed Raven (*C. crassirostris*), although he admits that it has

never been imported, because he says that sooner or later it is sure to be.

Black-and-white Jackdaw (*Colœus dauuricus*).

Purplish-black above, the margins of the feathers glossy; the primary coverts and flights more or less green; tail greenish in certain lights; a broad greyish white collar on back and sides of neck; head glossy purplish-black becoming bluer on fore-neck; ear coverts and vicinity of the same with ashy streaks; rest of body below greyish-white excepting the thighs, vent, and under wing and tail coverts, which are purplish-black; bill and feet black; irides brown. Female described as slightly larger; it doubtless differs somewhat in the character of its bill. Hab., Northern Asia, from the Altai Mountains to Eastern Siberia; China and Japan. (Sharpe.)

According to Seebohm ("Birds of the Japanese Empire," p. 97), this appears to be a rare bird in Japan; he tells us nothing about its habits there.

Mr. C. W. Campbell, writing on "Birds Collected in Corea" (*The Ibis*, 1892, p. 238), says:—"In large flocks I always saw numbers of a smaller and white-breasted species, which I took to be *Corvus dauuricus*. I frequently tried to obtain a specimen, but was always baffled by the wariness of the bird."

Capt. H. A. Walton, describing the "Birds of Peking" (*The Ibis*, 1903, p. 21), tells us that "It was especially numerous during the very cold weather in December and January. Its voice is very like that of the English Jackdaw."

Mr. J. D. D. La Touche (*The Ibis*, 1906, p. 432) says that at Chinkiang it is "extremely abundant throughout the winter. It arrives in October and leaves early in spring."

This is all that I have been able to discover respecting the wild life. It was presented to the Zoological Society of London in July, 1890, by Mons. J. de la Touche.

The Chaplain Crow (*Corone capillana*), which ranges from Persia and Mesopotamia eastwards into India, is regarded as a mere sub-species of our Hooded Crow; ten specimens have been exhibited at our Zoological Gardens.

Indian Crow (*Corone splendens*).

General colour greyish-black; the back, outer webs of primaries and tail with a greenish or steely gloss; wings slightly purplish; nasal bristles, crown, orbital region, cheeks and throat purplish-black; nape, sides of neck, mantle, fore-neck and chest drab-brown; bill and feet black; irides dark brown. The female is a trifle duller and smaller than the male, with slightly shorter bill. Hab., India and Ceylon. Jerdon observes ("Birds of India," Vol. II., pp. 299, 300):—"This Crow, though eminently social, is not strictly gregarious, but it roosts in company, in vast numbers, and there are certain spots near all large towns or stations where they nightly congregate for this purpose, coming from a distance varying from three to ten miles of radius."

"The food of this Crow is greatly varied; but, as a rule, it may be said that it lives on the crumbs that fall from the food of man. Many natives eat habitually out of doors, and the remnants of boiled rice or other grain are thrown away, whilst in those that feed within doors the fragments are pitched out at certain stated intervals, well known to the Crows of the vicinity, who proceed from house to house, warned by some watchful member of their community when the feast is at hand. So well known is the process of cooking that a small fire, or rather its attendant smoke, even in some unusual spot far away from their daily haunt, will at once attract one or two hungry Crows, who, if the symptoms of food are favourable, remain for the expected leavings. In the intervals between the meals of mankind, some betake themselves early in the morning to some plain that has perhaps been flooded, to pick up a crab, a frog, a fish, or insects. Others hunt for grubs in ploughed lands, or in pastures along with cattle, and others may be seen ridding cattle of the ticks or other insects that infest them; some betake themselves to the side of a river or tank; a few, in the vicinity of large rivers or creeks, follow vessels, and hunt with the Gulls and Terns; and not a few, about Calcutta and other large cities, find a plentiful repast on the corpse of some dead Hindoo, or on that of a dead bullock. A banian tree, a peepul, or other tree with ripe fruit, will always be visited by many Crows; and if a flight of winged termites takes place, morning or evening, there are the Crows to be found in abundance, and adroitly catching them in company with Bee-eaters, Kites, King-crows, and, mayhap, Bats."

"The Crow breeds from April to July, according to the locality, and, occasionally, two or three build in the same tree, though, in general, there is not more than one. Now and then they select a corner of a house or some convenient nook, but generally build in trees, making a moderate fabric of sticks, occasionally thinly lined with some softer materials." "The eggs are usually four in number, and are greenish-blue, spotted and blotched in various degrees with brown."

The London Zoological Society first secured this Crow for the Gardens in June, 1870, since which date a fair number of specimens has been received both at the London and Amsterdam Gardens, and in those of Berlin it has not been unrepresented.

American Crow (*Corone americana*).

Glossy purplish-black with violet reflections; head and neck somewhat brownish; wings steel-black, slightly glossed with violet; the outer coverts, primary coverts, and primaries outwardly glossed with green; tail-feathers greenish on inner webs; bill and feet black; irides brown. Female rather smaller and with shorter bill. Hab., North America.

According to Charles Bendire ("Life Histories of North American Birds," Vol. II.), the food of this Crow seems to be remarkably varied, but he appears to think that on the whole it does more good than harm to the farmer. As regards the nidification he says (pp. 411-412): "Nest-building in the more southern States begins sometimes by Feb. 20, and correspondingly later northward. In the vicinity of Washington, district of Columbia, fresh eggs may be occasionally found in the last week in March, but more frequently during the first two weeks in April. Along our northern border they nest generally about the beginning of May; and even in the most northern portions of their range they have been known to breed equally early, but most frequently nidification here is protracted well into June. In Idaho, Washington, and Oregon it is at its height between April 15 and May 20. The nests are bulky, usually well constructed, and placed in the forks of branches, generally well up and hard to reach. Occasionally one is placed near the main trunk, this being mostly the case where bushy cedars or junipers are used. Any sort of tree may be chosen for a nesting site, providing it is one of dense foliage which will hide the nest well. In some localities pine trees seem to be preferred, while in others oaks are often selected. In the West cottonwoods, junipers, and willows are most frequently used.

Nests are usually placed at heights varying from 20ft. to 60ft.; but I have found some barely 6ft. from the ground, and in many localities in the West they are rarely placed over 20ft. up. Here also they are said to occasionally nest on the ground, but I have never observed this personally. Crows rarely nest in deep forests, the borders of woods and the river bottoms being preferred for such purposes. The nests are composed outwardly of sticks, weed-stalks, corn-husks, and other coarse material, and lined with grape-vine bark, fine roots, dry grass, leaves, straw, moss, rags, wool, and hair, the lining varying in different localities. Where cattle are plentiful the nests are often found lined with more or less of their hair. These finer materials are well knitted together. The outer diameter of the nest is usually about 24in. by 9in. in depth. The inner cup is from 4in. to 6in. deep, and from 12in. to 15in. in diameter. This prevents the eggs from being thrown out of the nest during high winds when placed in slender branches in the extreme tops of trees.

"The number of eggs to a set varies from four to eight. Sets of five are most commonly found, while those of seven are rare, and those of eight quite unusual. Mr. A. C. Kempton, Wolfville, Nova Scotia, writes me that he found a set of ten eggs in the spring of 1890, which he believes were laid by the same bird. In the Western States usually from three to five eggs constitute a set, and those of six, according to my observations, are much rarer than in the East. Incubation lasts about eighteen days, and both parents assist in this duty. The young are born blind and naked, and remain in the nest about three weeks. While Crows steal many of the eggs of other birds, they apparently do not molest any of their own kind, but if several pairs nest close together they will steal nesting material from each other whenever an opportunity occurs. The old nests are resorted to for several seasons in succession where not molested. Only one brood is raised in a season."

"Crows' eggs are rather handsome, and vary greatly in shape, size, colour, and markings; the majority may be called ovate, but both short and rounded ovates and elliptical and elongated ovates are also found in good series. The ground colour varies from malachite and pale bluish-green to olive-green, and occasionally to an olive-buff.* The markings usually consist of irregularly shaped blotches and spots of different shades of browns and greys. In some specimens these are large and irregularly distributed over the egg, usually predominating about the larger end, leaving the ground colour clearly visible. In others, again, the markings are fine, profuse, and evenly distributed, giving the egg a uniform dark olive-green colour throughout."

"The average measurements of 292 eggs in the United States National Museum collection is 41.40 by 29.13 millimetres, or about 1.63in. by 1.15 in."

The London Zoological Society first acquired this species in April, 1862, and two were presented to the Gardens in August, 1875; it is not probable that it will now be allowed to be imported, unless it is excepted from protection as a more or less mischievous bird.

Australian Crow (*Corone australis*).

Black glossed with purple, the outer webs of the primaries more steely in colouring; head duller than back; throat with lanceolate, greenish-black feathers, inclining to purple on the lower throat; lower surface of flights wholly black; bill and feet black; irides dark brown. Female smaller than male, with rather shorter bill. Hab., Australia.

Gould says ("Handbook to the Birds of Australia," Vol. I., p. 476): "In Western Australia, for the greater part of the year, this bird is met with in pairs or singly; but in May and June it congregates in families of from twenty to fifty, and is then very destructive to the farmer's seed crops, which appear to be its only inducement for assembling together, as it is not known to congregate at any other period. In New South Wales and Tasmania it is also usually seen in pairs, but occasionally congregated in small flocks. At Port Essington, where it is mostly seen in pairs, in quiet, secluded places, it is not so abundant as in other parts of Australia.

"The stomach is tolerably muscular, and the food consists of insects, carrion of all kinds, berries, seeds, grain, and other vegetable substances.

"Its croak very much resembles that of the Carrion Crow, but differs in the last note being lengthened to a great extent.

"Its nest, which is formed of sticks and of a large size, is usually placed near the top of the largest gum trees. The eggs, which are three or four in number, are very long in form, and of a pale dull green colour, blotched, spotted, and freckled all over with umber-brown, the blotches being of a much greater size at the larger end; they are about 1¾in. long by 1⅛in. broad."

This species first arrived at our Gardens in May, 1865; a second was purchased in May, 1872, and two were received in exchange in July, 1876; specimens were presented in June, 1883, and July, 1890, and two were purchased in July, 1893.

Abyssinian Crow (*Rhinocorax affinis*).

Above glossy purplish-black; sides of face and neck greenish; nasal bristles black, completely hiding the nostrils; under surface glossy steel-black; bill and feet black; irides brown. Female not differentiated, but, judging from Heuglin's remarks, a trifle smaller than the male. Hab., North-eastern Africa, ranging into Palestine.

Heuglin observes ("Ornithologie Nord-Ost Africas," p. 505): "This species generally lives altogether more gregariously than *C. umbrinus* and *scapularis* in the Steppes, mountains, and on the seashore; also it is not infrequently to be seen round human habitations. In high country it appears to nest in colonies on the cliffs. I saw there whole troops circling about the rocks in their peculiar flight after the manner of Jackdaws; in the plains only occurring singly or at most in pairs, and here frequently an inhabitant of the most sterile deserts, particularly near caravan camps and the hollows of wells."

Mr. E. Lort Phillips, describing birds from Somaliland (*The Ibis*, 1885, p. 389), says: "Crows (probably *Corvus affinis*) never failed to appear in the neighbourhood as soon as the tents were pitched. Nearly all the Crows' nests contained eggs of the Great Spotted Cuckoo, and in one nest there were twelve eggs, four only belonging to the rightful owner." In *The Ibis* for 1891, p. 628, E. Cavendish Taylor describes the eggs as "smaller than eggs of *Corvus umbrinus*, and very blue in colour." The fact that the bird actually is the Abyssinian Crow is proved by a skin obtained by Capt. Swayne, R.E. (*cf. The Ibis*, 1894, p. 328).

Col. J. W. Yerbury, writing on the birds of Aden

* Major Bendire also describes eggs as pinkish buff speckled with fine dots of drab; creamy white spotted with light brown, drab, and lavender; and salmon buff blotched with pinkish vinaceous; his descriptions are too prolix to be quoted in full.

(*The Ibis*, 1896, p. 26), says: "When first I arrived at Lahej in March, 1895, there was a large flock of these birds in the neighbourhood. My attention was attracted to them by their curious call and their non-corvine look when on the wing, the latter due, I fancy, to a shortness of tail and great breadth of wing near the body, quite out of proportion to the size, as a Crow. The whole flock disappeared in about a fortnight, as, when I went out some days later to shoot another specimen, not a single bird was to be seen."

In *The Ibis* for 1898, p. 394, Mr. E. Lort Phillips says: "This short-tailed Raven is extremely common in Somaliland, from the sea-coast at Berbera to the top of the Goolis. It is a persistent and most fearless camp-follower, and is ever on the look-out for scraps from the kitchen. It has a curious habit of walking about with its beak wide open, as if greatly affected by the heat."

Mr. F. J. Jackson found the stomach of a female which he examined "full of eggs and young birds." (*cf. The Ibis*, 1899, p. 588.)

Messrs. Rothschild and Wollaston, when in the Sudan, found this species "always very careful to keep out of range of a gun." (*The Ibis*, 1902, p. 13.)

Two specimens of this Crow arrived at the London Zoological Gardens in July, 1880. They are recorded in the list under the generic name of *Corvus*. I should have thought that this broad-winged, short-tailed, prominently bristle-tufted-billed bird was generically distinct enough from the typical Crows.

Pied Crow-Shrike (*Strepera graculina*).*

Glossy blue-black; tail-feathers crossed at base by a broad white band and tipped with white, more broadly on the inner than outer webs; base of primaries also white, forming a large speculum; under tail-coverts white; bill and feet black; irides yellow. Female smaller than the male. Hab., Australia.

Gould says of this species ("Handbook," Vol. I., pp. 168, 169):—"It is very generally distributed over the colony of New South Wales, inhabiting alike the brushes near the coast, those of the mountain ranges, and also the forests of *Eucalypti* which clothe the plains and more open country. As a great part of its food consists of seeds, berries, and fruits, it is more arboreal in its habits than some of the other species of its group, whose structure better adapts them for progression on the ground, and whose food principally consists of insects and their larvæ. Like the other members of the genus, it is mostly seen in companies, varying from four to six in number, seldom either singly or in pairs. I am not, however, inclined to consider them as gregarious birds in the strict sense of the word, believing as I do that each of these small companies is composed of a pair and their progeny, which appear to keep together from the birth of the latter until the natural impulse for pairing prompts them to separate.

"It is during flight that the markings of this bird are displayed to the greatest advantage, and render it a conspicuous object in the bush; while on the wing it utters a peculiar noisy cry, by which its presence is often indicated.

"The nest, which is usually constructed on the branches of low trees, sometimes even on those of the *Casuarinæ*, is of a large size, round, open, and cup-shaped, built with sticks and lined with moss and grasses. The eggs, which I was not so fortunate as to procure, are said to be three or four in number."

A. J. North says ("Catalogue of Nests and Eggs," p. 55):—"It constructs its nest in the forked branch of a tree, usually a *Eucalyptus* or *Casuarina;* it is a large, open, bowl-shaped structure, outwardly composed of sticks, and lined with strips of bark and grasses. Eggs three or four in number for a sitting, of a pale chocolate-brown, with faint blotchings and markings of reddish-brown, in some instances a few obsolete irregular-shaped spots of lilac appear as beneath the surface of the shell. Length (A) 1.65 × 1.12 in.; (B) 1.7 × 1.15 in.; (C) 1.63 × 1.2 in.

"The breeding season commences in August and lasts during the three following months."

This species first reached the London Zoological Gardens in March, 1868; a second example was purchased in July, 1869, and two others in May, 1873; one was also received in exchange in May, 1887.

Hill Crow-Shrike (*Strepera arguta*).

Dull blackish, browner at tips of wing-feathers and on sides of neck; wings black, primaries with a great part of the inner web white; secondaries narrowly tipped with white; tail greyish externally, the feathers, excepting the two central ones, broadly tipped with white on the inner web and narrowly on the outer one; breast with narrow metallic shaft-streaks; under tail-coverts white; bill and feet black; corner of mouth yellow; irides orange-yellow. Female much greyer than the male and with a shorter bill. Hab., Tasmania.

Gould observes ("Handbook," Vol. I., pp. 171, 172):—"It is the largest, the boldest, and the most animated species of the genus yet discovered. It is not strictly gregarious, it is often seen in small companies of from four to ten, and during the months of winter even a greater number are to be seen congregated together. The districts most suited to its habits are open glades in the forest and thinly-timbered hills. Although it readily perches on the trees, its natural resort is the ground, for which its form is admirably adapted, and over which it passes with amazing rapidity, either in a succession of leaps or by running. Fruits being but sparingly diffused over Australia, insects necessarily constitute almost its sole food, and of these nearly every order inhabitating the surface of the ground forms part of its diet; grasshoppers are devoured with great avidity.

"Its note is a loud ringing and very peculiar sound, somewhat resembling the words *clink, clink*, several times repeated, and strongly reminded me of the distant sound of the strokes on a blacksmith's anvil; and hence the term *arguta* appeared to me to be an appropriate specific appellation for this new species.

"All the nests I found of this species either contained young birds or were without eggs; I am consequently unable to give their size or colour. The nest, which is of a large size, is generally placed on a horizontal branch of a low tree; it is round, deep, and cup-shaped, outwardly formed of sticks and lined with fibrous roots and other fine materials."

A. J. North ("Catalogue of Nests and Eggs," pp. 57, 58) says:—"Eggs three for a sitting, of a light reddish or buffy-brown ground colour, spotted or blotched with markings of a darker tint; one specimen, B. is a rounded-oval in form, and the markings are clouded and not so well defined. Length (A) 1.78 × 1.18 in.; (B) 1.63 × 1.21 in.; (C) 1.64 × 1.22 in."

"The months of September and October constitute the breeding season of this species."

* Dr. Sharpe places the so-called Crow-Shrikes among the true Crows, in which action I presume he is correct. Gould places them among the true Shrikes, together with the Piping-Crows.

A specimen of this bird was presented to the London Zoological Society in May, 1865.

Grey Crow-Shrike (*Strepera cuneicaudata*).

Above brownish-grey, clearer on lower back and rump; wing-coverts indistinctly tipped with white; flights blackish-brown, edged on outer webs with ashy white, purer white on secondaries, which also have white tips; inner webs of primaries with basal half white; tail-feathers blackish-brown with broad grey margins, inner webs tipped with white; lores, orbital region, cheeks, ear-coverts and chin dark brown; body below ashy-brown, the feathers with ill-defined paler central streaks; thighs dark brown; under tail-coverts white; under wing-coverts grey; flights below dark brown, the primaries with the basal half white; bill and feet black; irides orange. Hab., South-west Australia.

The female is not differentiated, but probably has a shorter bill than the male.

Dr. Sharpe separates *S. plumbea* from Western Australia as a distinct subspecies. Gould says ("Handbook," Vol. I., pp. 173, 174) :—"Gilbert states that in Western Australia he mostly met with it in the thickly wooded forests, singly or in pairs, feeding on the ground with a gait and manners very much resembling the Common Crow. Its flight is easy and long-sustained, and it occasionally mounts to a considerable height in the air.

"The stomach is very muscular, and the food consists of coleoptera and the larvæ of insects of various kinds.

"It breeds in the latter part of September and the beginning of October, forming a nest of dried sticks in the thickest part of the foliage of a gum—or mahogany—tree and laying three eggs, the ground colour of which is either reddish buff or wood-brown, marked over nearly the whole of the surface with blotches of a darker tint. Their medium length is one inch and nine lines by one inch and two and a half lines broad."

Seven examples of this species reached the London Zoological Gardens between the years 1864 and 1874.

Sooty Crow-Shrike (*Strepera fuliginosa*).

Glossy soot-black; primaries slightly marked with white at base of inner webs; outer primaries broadly tipped with white; tail blackish; the outer webs greyish, inner webs with a large white spot at tips slightly extending on to outer webs; under surface a trifle greyer than the upper; bill and feet black; irides bright yellow. Female slightly smaller than the male. Hab., Tasmania.

According to Gould ("Handbook," Vol. I., p. 170), this species frequents different localities from those affected by others of the genus, "those preferred being low swampy grounds in the neighbourhood of the sea and woods bordering rivers. Like the other species of the genus, it subsists on insects and grubs of various kinds, to which pulpy seeds and berries are frequently added.

"It is very active on the ground, passing over the surface with great rapidity.

"It breeds in the low trees, constructing a large and deep nest very similar to that of the European Crow, and lays three eggs, of a pale vinous brown, marked all over with large irregular blotches of brown, one inch and five-eighths long by one inch and a quarter broad.

"I have seen this bird in a state of captivity, and it appeared to bear confinement remarkably well."

The Zoological Society of London purchased a specimen in April, 1870. Russ says that it has seldom arrived alive in Europe.

Moorish Magpie (*Pica mauritanica*).

Glossy black, the black glossed with green, the rump and upper tail-coverts with green or purple; scapulars pure white; tail metallic green, glossed with purple towards the tip; wing-coverts metallic green edged with blue; primaries blackish, the inner webs largely white; secondaries metallic purplish blue; a bare cobalt-blue patch behind eye; lower abdomen pure white; bill and feet black; irides dark brown. Female slightly smaller than the male. Hab., Algeria and Morocco. (Sharpe.)

J. I. S. Whitaker ("Birds of Tunisia," Vol. II., pp. 12, 13) says :—"On the plains between Feriana and Gafsa, in Central Tunisia, I have often met with the Moorish Magpie in small parties, frequenting patches of cultivated land dotted over with thorn bushes, and further south I have found it near Ras-el-Aïoun, among the tamarisk bushes bordering the Oued Seldja.

"Like Grey Shrikes, Bush-Babblers, and other wary birds, this Magpie is fond of open country, where the monotony of the level plain is only broken by isolated clumps of bushes. These afford sufficient shelter to the birds, and at the same time afford admirable points of vantage from which to spy the surrounding country.

"*P. mauritanica* closely resembles our European Magpie in its general life and habits; its note, also, is not dissimilar.

"The Arab name for the Magpie, *Agaz* or *Agag*, like many Arab names for birds, is taken from its harsh cry, and no doubt the name of *Agasse*, used in some parts of France, has a similar derivation. Like the common Magpie, the Moorish bird will feed on almost anything, and in the arid semi-desert wastes of Tunisia its diet consists largely of locusts and coleoptera, which abound in those regions.

"In South Tunisia it is an early breeder, and I have found nests containing nearly fledged young birds as early as the first week in April. Further north it no doubt breeds later.

"The nest is nearly always placed in the middle of a thick and almost impenetrable thorn-bush, and at a height of from six to ten feet from the ground; it is of the usual domed shape, composed of sticks and twigs, and lined with a little wool and hair. The eggs, which are generally six in number, although occasionally as many as seven, or even eight, may be found, resemble those of our European bird, being of a greenish colour, finely spotted all over with brown. They measure from 31 to 35 mm. in length, by 23 to 25 mm. in breadth."

The London Zoological Gardens first received this species in July, 1870, and, according to Russ, this is the only instance in which it has been imported.

The Himalayan Magpie (*P. bottanensis*) is, according to Sharpe and Dresser, only a variety of the European species. The London Gardens acquired it in 1875.

Chinese Blue Magpie (*Cyanopolius cyanus.*)

Pale ash-grey, more or less glossy above, especially on the upper tail-coverts; wings, excepting the least-coverts, pale sky blue; primaries black, edged with blue towards the base, and with white towards the tip; tail pale sky blue; two central feathers with broad white tip, others very minutely white-tipped; head and nape black; cheeks and throat white; centre of body below whitish; wings below pale greyish-brown, flights white at base of inner webs; bill and feet black; irides red. Female with a much shorter and less pointed bill. Hab., Eastern Siberia, Japan, and North China.

Seebohm observes ("Birds of the Japanese Empire," p. 99) :—"The Eastern Blue Magpie is a resident in Southern Japan." He further points out that the

Spanish Blue Magpie differs chiefly from this species in its browner colour, and the fact that the white tips to the central tail-feathers only occur accidentally. He thinks it probable that this species was originally introduced into Spain, as the Chinese Ringed Pheasant was into England, and has since been modified in consequence of the greater rainfall of Spain and for protective purposes; if so, the Spanish bird can only be regarded as, at most, a "subspecies," as it is now the fashion to call locally varying types.

J. D. D. La Touche (*The Ibis*, 1906, p. 433) says:—"The Blue-winged Magpie is very common in the plains, while in winter parties frequent copses and gardens about the villages, and are also to be met with along the willow-bordered creeks and ponds. It breeds in colonies on high trees around the villages of the plain. The nest is generally difficult of access, being nearly always placed high up in a tree, and as a rule in a thin fork some distance from the trunk. I have not had an opportunity of watching the building of the nest, but it is generally completed about May 20. A number of nests examined on May 29 were either empty or contained one egg, but on the same day I obtained from a native a clutch of four eggs. The nests are built of sticks outwardly, and within there is a thick lining, or, more properly, an inner nest composed of moss, cows' hair, wool, fibres, and twigs. A good deal of mud is used as a base to the inner nest. The inner diameter of one lining, which I measured, was 5½ in., and the depth about 1½ in. Besides the clutch mentioned above I have obtained fresh eggs on May 26, a few that were fresh and a number that were incubated on June 14. Two eggs brought to me on July 11 were, one incubated, the other rotten.

"Out of twenty-seven eggs taken, eight have the ground colour of a light greenish grey, seventeen of a brownish yellow clay colour or pale olive-brown, and one of an intermediate shade. The markings consist of roundish spots and specks, or sometimes of short lines, of brown and purplish grey, the latter often on the surface as well as beneath it. As a rule, every egg has also a few surface specks of very dark brown. The shape is ovate or very rarely elongated ovate. The twenty-seven eggs in my collection average 1.08 × 0.83 in.; the largest is 1.16 × 0.87 in., and the smallest 1.00 × 0.79 in."

A specimen of the Chinese bird reached the Zoological Gardens of London in October, 1873, and one of the Spanish race in August, 1878. Many others of both races were received later, the Chinese form being bred in the Gardens in 1884 and 1888, and the Spanish form in 1890.

Occipital Blue Pie (*Urocissa occipitalis*).

Above pale purplish brown; a patch of white on nape and hind neck; wings much bluer; flights with azure blue outer and blackish inner webs; secondaries with white terminal bands; primaries edged externally with ashy shading into blue at tips, and with a terminal white spot; upper tail-coverts blue tipped with black, and subterminally greyish; tail blue, with broad white tip; all the feathers excepting the two central ones with a broad subterminal black band, and in front of this, on inner web of most of them, a white spot; head entirely black; plumes of crown with white tips; fore neck black, slightly shaded with blue; under surface otherwise silky white; flanks and thighs washed with bluish grey; bill coral-red; feet orange; irides red. Female with far more powerful bill than the male. Hab., Himalayas.

Jerdon ("Birds of India," Vol. II., p. 310) says:—"It breeds at about 5,000 feet, making, says Hutton, a loose nest of twigs, externally lined with roots. The nest is built on trees, sometimes high up, at others 8 or 10 feet from the ground. The eggs are from three to five, of a dull greenish ash-grey, blotched and spotted with brown dashes, confluent at the larger end. It is very terrene in its habits, feeding almost entirely on the ground. Several of these Magpies will often follow a leopard for more than a mile, perching on the trees and bushes above it, and keeping up a continual screeching ("Indian Sporting Review," 1856). It is sometimes caged, and bears confinement very well. It will eat raw meat, young or small birds, insects, and, indeed, almost any kind of food."

An example of this handsome Magpie reached the London Zoological Gardens in June, 1868; in 1893 it was imported by Miss Hagenbeck, and I believe others have come to hand from time to time.

Siamese Blue Pie (*Urocissa magnirostris*).

Darker than the preceding species, wings not so blue; white tips of primaries ill-defined or wanting; bill and tarsus much stouter. Hab., Burma and Siam.

Colonel Bingham says (*cf.* Hume's "Nests and Eggs of Indian Birds," Second Edition, Vol. I., pp. 15, 16):—"I have found three nests of this handsome Magpie—two on the bank of the Miplay Choung on April 14, 1879, and March 5, 1880, respectively, and one near Meeawuddy, on the Thoungyeen river, on March 19, 1880.

"The first contained three, the second four, and the third two eggs.

"These are all of the same type, dead white, with pale claret-coloured dashes and spots rather washed-out looking, and lying chiefly at the large end. One egg has the spots thicker at the small end. They are moderately broad ovals, and vary from 1.19 to 1.35 in length, and from 0.93 to 1.08 in breadth.

"The nests were all alike, thick, solid structures of twigs and branches, lined with finer twigs, about 8 or 9 inches in diameter, and placed invariably at the top of tall, straight saplings of teak, pynkado (*Xylia dolabriformis*), and other trees at a height of about 15 feet from the ground."

The London Zoological Society purchased examples of this species in August, 1862, and May, 1871, since which date no less than four specimens have been presented to them by Mr. C. Clifton, and as many more by Mr. J. M. Cook. Dealers have probably confounded it with *U. occipitalis*.

Chinese Blue Pie (*Urocissa erythrorhyncha*).

Lilacine-brown washed with purple; wings dull blue, brighter on outer webs of flights, inner webs dark brown; outer webs of primaries with white tips; secondaries with white terminal bar; upper tail-coverts broadly tipped with black and subterminally pale grey; tail azure blue, broadly white-tipped, excepting on central feathers, with a broad subterminal black band, preceded on inner web by a more or less defined white bar; head and throat black; frontal feathers tipped with lavender-grey, which colour covers the rest of the crown and nape; under-surface pale blue-greyish, greyer on flanks; under wing-coverts greyish-white; under tail-coverts white; bill and feet coral-red; irides deep sienna-brown tinged with crimson. Female smaller and with shorter and heavier bill. Hab., China.

Mr. J. D. D. La Touche (*The Ibis*, 1900, pp. 40, 41) says:—"A common bird all over Fohkien. On the 25th April, 1898, we took a clutch of five eggs from a nest placed on a tree in the valley below Kuatun. These were much incubated. The colour is a pale yellowish or greenish clay, with spots and longitudinal

splashes of somewhat pale and dull reddish-brown and reddish-grey (underlying). The markings on four eggs are concentrated on the large end, where they form a well-marked crown or cap, and where the underlying splashes are confluent, the rest of the egg being but sparsely marked. In the fifth egg there is a broad ring round the small end, the rest of the egg, as in the others, being but lightly marked. In shape these eggs are ovate, inclining to oval, one being almost oval. They measure 1.27 × 0.93, 1.26 × 0.91, 1.25 × 0.91, and 1.23 × 0.92 inch.

"On the 28th April following another clutch of five eggs was taken from a nest placed on a bamboo at a height of about 20 ft. from the ground. These eggs, which were very slightly incubated, have a lighter ground-colour than the above, one egg markedly so. The spots are much more numerous and much smaller. Three of them have a rough ring of reddish-grey underlying blotches under the reddish-brown spots, which are larger there than on the rest of the egg. In the fifth and light-coloured egg this ring is very slight, and the surface and underlying markings are small, there being only three or four underlying blotches. These are all broader eggs, with a tendency to being oval, except one, which is a broad ovate. They measure 1.22 × 0.95, 1.21 × 0.93, 1.20 × 0.96, and 1.18 × 0.93 (two eggs) inch. We did not take the nest, which appeared to be built in the usual style, and was a slight structure, composed of thin twigs and tendrils."

The London Zoological Society purchased an example of this bird in February, 1861. Russ observes that it is rarely imported, but nevertheless may be met with at all the zoological gardens and the larger dealers.

Yellow-billed Blue Pie (*Urocissa flavirostris*).

Above bluish-lavender; apical two-thirds of primaries greyish-white and white-tipped externally; secondaries more distinctly white-tipped; upper tail-coverts azure blue tipped with black, and with a narrow subterminal bluish-white bar; tail azure blue with broad white tips; all excepting the two central feathers with a subterminal black bar, preceded on inner web by an ill-defined white bar; head, neck, mantle and breast black, with a large neutral white patch faintly tinted with blue; underparts otherwise ashy grey, paler on abdomen and under tail-coverts; under wing-coverts yellowish; edge of wing tinted with lavender; bill yellow; feet orange-yellow; irides brownish-red. Female not differentiated; probably with stronger and shorter bill than the male. Hab., Himalayas.

Jerdon ("Birds of India," Vol. II., p. 311) says:—"It is found in Cashmere and Jummoo, in Kumaon, in parts of Nepal, and in Sikhim, where it is the only species. It occurs about Darjeeling from 6,000 ft. to 10,000 ft. or so; wanders about a good deal, generally flying low, and alighting on low trees and shrubs, sometimes on a stone, or the stump of a tree. It lives chiefly on large insects, grasshoppers, locusts, etc., and it has a loud, ringing call which the natives attempt to imitate in the names given above.* I had the nest and eggs brought me once. The nest was made of sticks and roots; the eggs, three in number, were of a greenish-fawn colour, very faintly blotched with brown."

Hume states ("Nests and Eggs," Second Edition, Vol. I., pp. 16, 17): "The Yellow-billed Blue Magpie breeds throughout the lower ranges of the Himalayas in well-wooded localities from Hazara to Bhootan, and very likely further east still, from April to August, mostly, however, I think, laying in May. The nest, which is rather coarse and large, made of sticks and lined with fine grass or grass-roots, is, so far as my experience goes, commonly placed in a fork near the top of some moderate-sized but densely-foliaged tree.

"I have never found a nest at a lower elevation than about 5,000 ft.; as a rule, they are a good deal higher up."

"The eggs are of the ordinary Indian Magpie type, scarcely, if at all, smaller than those of *U. occipitalis*, and larger than the average or eggs of either *Dendrocitta rufa* or *D. himalayensis*. Doubtless all kinds of varieties occur, as the eggs of this family are very variable; but I have only seen two types—in the one the ground is a pale, dingy, yellowish-stone colour, profusely streaked, blotched, and mottled with a somewhat pale brown, more or less olivaceous in some eggs, the markings even in this type being generally densest towards the large end, where they form an irregular mottled cap; in the other type the ground is a very pale greenish-drab colour; there is a dense confluent raw-sienna-coloured zone round the large end, and only a few spots and specks of the same colour scattered about the rest of the egg. All kinds of intermediate varieties occur. The texture of the shell is fine and compact, and the eggs are mostly more or less glossy.

"The eggs vary from 1.22 to 1.48 in length, and from 0.8 to 0.96 in breadth; but the average of twenty-seven eggs is 1.3 × 0.92."

Three specimens of this species reached the London Zoological Gardens as an exchange in May, 1877; in 1886 the species arrived at the Amsterdam Gardens; and in 1893 at those of Berlin.

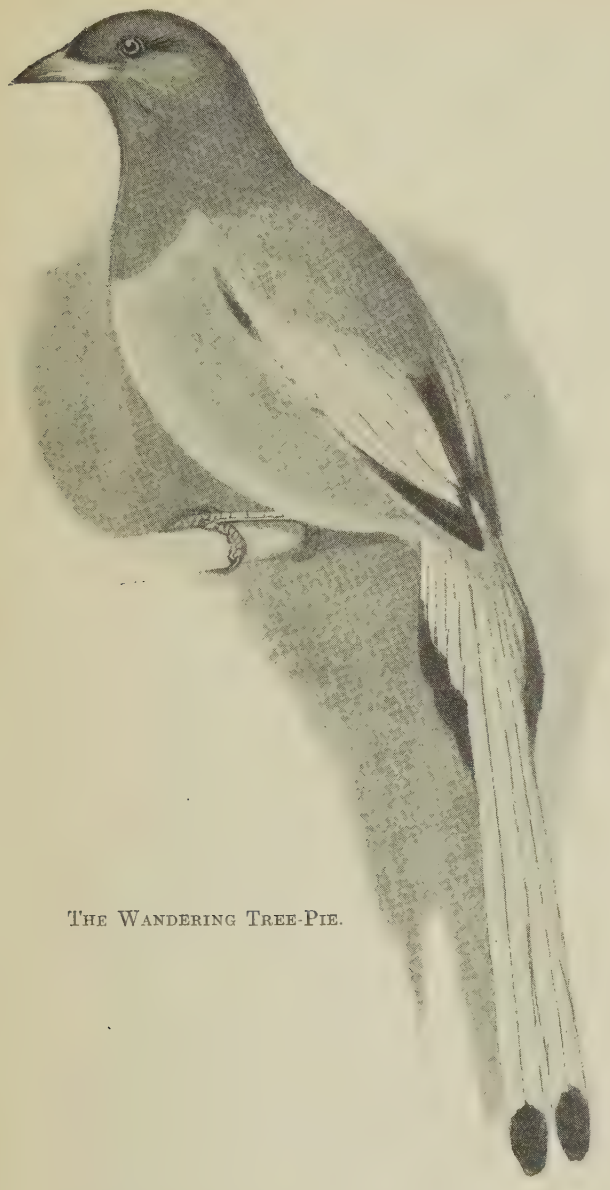
Piapec (*Cryptorhina afra*).

Glossy purplish-black; wing-coverts slightly greenish; primaries brown, tipped with black; secondaries with indications of bars when seen in certain lights; upper and under tail-coverts, tail (barred in certain lights), and under wing-coverts brown; flights below with greyish inner webs, paler towards the base; bill black; feet leaden-black; irides crimson, with a faint external lilacine tint. Female much smaller, and with black-tipped yellow bill and hazel irides. Hab., N.E. Africa and Senegambia.

Heuglin observes ("Ornithologie Nord-Ost Afrikas," pp. 492, 493): "The Senegal Magpie is an extremely lively bird, in its behaviour much reminding one of *Lamprotornis ænea*. It is found in Southern Kordofan, along the whole of the White Nile and Gazelle River, at the upper Bahr el Azrag, and, according to Rüppell, also in Abyssinia. Living in pairs and small companies, the Scharal* assembles together, after the completion of the business of breeding at the commencement of the rainy season (June), in great flocks, disappears for several months, and reappears again in the dry season. Its favourite resorts are flat pastures with *Doleb* palms (*Borassus æthiopicus*), in the dry clusters of leaves of which it lives amicably together with *Falco ruficollis*, *Columba guinea*, and some large bats, and there nests. The breeding season occurs in the months of March to June; the nest itself, which is situated between the leaf-sheaths and the trunk, I have never been able to secure, as the smooth *Doleb* trunks are almost unclimbable; the entrance to the nest is frequently hedged with thorns. Before the commencement of daybreak these birds are already lively and occupy themselves, like Jackdaws, in chattering, whistling, and croaking, and flitting from one branch to another. With the dawn of day they seek the ground, with a continuous cry,

* These are rendered *Tying-jongring* and *Piangingjabbring*, at the head of Jerdon's account of the species.—A. G. B.

* Arabian name for the bird.



The Wandering Tree-Pie.

especially in the vicinity of cattle parks; there the manure is probed, beetles and locusts caught, and occasionally a butterfly seized when flying. When the dew dries up, and the cattle are driven out, the flock follows at no great distance, or comes quite confidingly into the farms and stables. The call-note is a clear, loud whistle, like that of the Alpine Chough (*Pyrrhocorax alpinus*). Action and bearing on the earth more Magpie-like, the tail is then carried horizontally, and is jerked up and expanded, and, particularly in the sunshine, *Ptilostomus** coquets like the glistening forms of Lamprotornis, and, chattering, approaches the male in order clearly to attract its attention. Towards evening the dispersed pairs and families assemble in the vicinity of their night quarters, the aforesaid *Doleb* palms, after the fashion of Starlings, engage during flight in various sports and evolutions, and only after the commencement of night settle down to silence and rest."

Mr. J. S. Budgett, in an account of the ornithology of the Gambia River (*The Ibis*, 1901, p. 491), says of this species: "M'Carthy Island. Very common. The males have red beaks, the females black; they act as scavengers." According to Heuglin, the red-billed birds are the young.

Captain Boyd Alexander says (*The Ibis*, 1902, p. 307): "This is a common species in the open country, consorting together in small flocks, and always to be found where cattle are grazing. It nests in the tops of tall cocoanut trees. Its flight is straight and steady, and, when travelling together, these birds give vent to a series of short, sharp cries, almost in unison.

"The males have the iris claret-coloured, the females hazel."

Mr. F. J. Jackson, describing birds collected during a journey to the Ruwenzori range (*The Ibis*, 1906, p. 570), observes: "The only two occasions on which I have seen these birds were at the same place, though on different days. Each time three individuals were observed. The place was an open plain, with short grass, and a few palm trees dotted about, in which the birds perched. They never seemed to stay long in one place, but flew from tree to tree, and very low to the ground, as if they intended to settle every moment. Their note had a curious and somewhat harsh sound."

I have discovered no definite account of the nidification of this Magpie. It first arrived at the London Zoological Gardens in 1865, then in 1872; in the Amsterdam Gardens in 1886; in 1891 the dealer, G. Bosz, imported it; and in 1892 it reached the Berlin Gardens.

Wandering Tree-Pie (*Dendrocitta rufa*).

Above deep rust-coloured, more orange on the lower back, rump, and upper tail-coverts; head and neck sooty-brown, passing gradually into the rusty colouring of the back; wings black, the least coverts dull grey, the median and greater coverts ashy-whitish, as also the outer webs of the inner secondaries; tail grey, broadly tipped with black; lores and throat blackish; remainder of under-parts bright fulvous; under wing-coverts and edge of wing grey, with a wash of fulvous; bill black; feet dark slaty; irides blood-red. The female is browner, and has a much stronger bill. Hab., India, ranging through Assam and Burma to Tenasserim.

Jerdon says of this species ("Birds of India," Vol. II., pp. 314, 315: "In the plains it is most common in well-wooded districts, and in the Carnatic and bare table-land it is only found occasionally about the larger towns and in hilly jungles; but, as you go further north, it is to be seen in every grove and garden, and about every village. It occurs singly occasionally, very frequently in pairs, and now and then in small parties. It flies from tree to tree with a slow undulating flight. At times it feeds almost exclusively upon fruit, but at other times on insects, grasshoppers, locusts, mantides, and caterpillars. The natives always assert that it destroys young birds and eggs, and consider it of the Shrike genus. Mr. Smith says 'he has known this bird enter a covered verandah of a house and nip off half a dozen young geraniums, visit a cage of small birds, begin by stealing the grain, and end by killing and eating the birds, and repeating these visits daily till destroyed.' Mr. Buckland informs me that he has known it enter a verandah and catch bats. It has a

* The genus to which Heuglin referred this species.—A. G. B.

variety of notes; the usual harsh cry of the Magpie; a clear whistling, somewhat metallic call, which Sundevall syllabizes into *Kohlee-oh-koor*, or *Kohlee-oh;* the Bengalese into *Kotree;* and it has also a feeble, indistinct note at the pairing season, which the male utters, and the female responds to in a sort of chuckle. When several pairs are together, they have a curious guttural call, which the Rev. Mr. Philipps, as quoted by Horsfield, says, 'sounds like *Kakak* or *Keke-kak*, repeated several times.' It builds a large nest of sticks, generally on lofty trees, and lays three or four eggs of a light greenish-fawn colour, sometimes with a few indistinct pale brown blotches."

This Magpie first reached the London Zoological Gardens in June, 1866; two more were acquired in June, 1868, and a fourth in May, 1873; two were purchased in June, 1883, and two were received in exchange in June, 1888. From time to time it has appeared in the shops of various dealers and has found its way into private collections, and consequently has appeared now and again at bird shows.

Himalayan Tree-Pie (*Dendrocitta himalayensis*).

Back and scapulars reddish earth-brown, passing into grey on the rump and upper tail-coverts; crown, nape, and hind neck bluish ashy; wings glossy black; the primaries, excepting the two outermost, white at base of outer web, forming a speculum; tail glossy black; two central feathers bluish ashy for about two-thirds of their length; the next pair also ashy at base; forehead, sides of face and throat black, browner on ear-coverts and lower throat; remainder of under parts ashy, paler on abdomen; thighs blackish, washed with bluish ashy; under tail-coverts orange; under wing-coverts black; bill horny, black; feet dusky black; irides red-brown. Female generally less grey, and with a heavier bill. Hab., Himalayas and Assam.

Jerdon says of this species ("Birds of India," Vol. II., pp. 316, 317):—"On the Himalayas it is very abundant from 2,000 ft. up to 7,000 ft., mostly so perhaps from 4,000 ft. to 6,000 ft. It is found in the more open parts of the forest, and near cultivation and villages. Like its congeners, it is a noisy bird, and has a variety of notes, similar in character to those of *D. rufa*. It usually feeds on trees on insects and fruit. I have, however, seen it on the ground eating grain. I have had the nest and eggs brought me at Darjeeling frequently. The nest is made of sticks and roots, and the eggs, three or four in number, are of a pale, dull greenish-fawn colour, with a few pale reddish-brown spots and blotches, sometimes very indistinct. Hutton, who got the eggs at Mussooree, describes them as dull greenish-ash, with brown blotches and spots, somewhat thickly clustered at the larger end."

Chinese Tree-Pie (*Dendrocitta sinensis*).

Back and scapulars brown, passing into greyish on the lower back; rump and upper tail-coverts whiter grey; crown and hind neck dull grey, deeper on mantle; wings black, shot with greenish; least coverts slightly greyish; primaries white at base, forming a speculum; tail black, shot with greenish; a broad frontal band, the feathers near base of bill and below the eye black; rest of face, throat and chest dull greyish-brown, passing into grey on breast and abdomen; thighs blackish-brown, shaded with grey; under tail-coverts orange; under wing-coverts blackish; bill and feet black; irides red-brown. (Russ.) Hab., China.

Next to nothing seems to be known respecting the wild life of this bird, but it probably has very similar habits to those of its Himalayan relative (with which Russ confounds it). Messrs. Rickett and La Touche speak of it as feeding under the big trees in the province of Fohkien (*The Ibis*, 1897, p. 606), and in their later paper (*The Ibis*, 1905, p. 26) they say: "Although a common resident on the wooded hills, we have never obtained its eggs." The Zoological Society of London first obtained the bird as a present from the late Consul R. Swinhoe in November, 1872, and two others were purchased for the Gardens in July, 1875; Russ asserts that it was also received at the Amsterdam Gardens, but he may be speaking of the Himalayan bird.

Hunting Crow (*Cissa chinensis*).*

Beautiful pale green in life, changing to verdigris-blue after death; head somewhat yellowish, conspicuously crested; wings, except lesser coverts, reddish-brown; flights dull brown on inner webs, the inner secondaries with a subterminal black bar and broad bluish-white tips; tail pale blue or green; central feathers white-tipped, the others with a broad subterminal black band and broad white tips; lores and orbital feathers extending backward into a nuchal band, black; bare orbital skin vermilion; bill and feet bright coral red; eyelid yellowish-brown, edged with coral red; irides deep reddish-brown (Jerdon), blood-red (Oates). Female with the bill stronger than in the male. Hab., South-Eastern Himalayas, through Burma to Tenasserim.

Jerdon observes ("Birds of India," Vol. II., pp. 312, 313): "This lovely bird is found in the South-eastern Himalayas; also in the hill ranges of Assam, Sylhet, Arracan, and Tenasserim. It is not rare in Sikhim from 1,200 feet to 5,000 feet, or nearly so. It wanders about from tree to tree, and picks various insects, grasshoppers, locusts, mantides, etc., off the leaves and branches. It has a rather loud, not unpleasant, call, besides the usual harsh cry of the Jays and Magpies. They are frequently tamed and caged, and become, says Blyth, 'very tame and fearless, are very amusing and imitative, sing lustily a loud and screeching strain of their own, with much gesticulation, and are highly carnivorous in their appetite. The Shrike-like habit, in confinement, of placing a bit of food between the bars of their prison, is in no species more strongly exemplified than in this.'

"Buch. Hamilton states that it is said to be trained in Tipperah to hunt like a hawk, and catch small birds."

In Hume's "Nests and Eggs of Indian Birds," Vol. I., pp. 17-19, we read: "According to Mr. Hodgson's notes, the Green Magpie breeds in Nepal in the lower valleys and in the Terai from April to July. The nest is built in clumps of bamboos, and is large and cup-shaped, composed of sticks and leaves, coated externally with bamboo leaves and vegetable fibres, and lined inside with fine roots. It lays four eggs, one of which is figured as a broad oval, a good deal pointed towards one end, with a pale stone-coloured ground, freckled and mottled all over with sepia-brown, and measuring 1.27 × 0.89."

"A nest of this species taken below Yendong, in Native Sikhim, on April 28th, contained four fresh eggs. It was placed on the branches of a medium-sized tree, at a height of about 12 feet from the ground; it was a large oval saucer, 8 inches by 6 inches, and about 2.5 in depth, composed mainly of dry bamboo leaves bound firmly together with fine stems of creepers, and

* Sharpe gives this inappropriate name in preference to *C. venatoria*, over which it has priority. I doubt the wisdom of this action, but follow him for the sake of convenience of reference.

was lined with moderately fine roots. The cavity was 5 inches by 4 inches, and about 1 inch in depth.

"The eggs received from Major Bingham, as also others received from Sikhim, where they were procured by Mr. Mandelli on April 21st and 28th, are rather broad ovals, somewhat pointed towards the small end. The shell is fine, but has only a little gloss. The ground-colour is white, or slightly greyish-white, and they are uniformly freckled all over with very pale yellowish and greyish-brown. The frecklings are always somewhat densest at the large end, where in some eggs they form a dull brown cap or zone. In some eggs the markings are somewhat denser, in some sparser, so that some eggs look yellower or browner, and others paler."

Mr. Hume expresses the opinion that this species is wrongly placed by Jerdon, the eggs being of the Garruline type. The term "Green Magpie" is admitted by Mr. Oates to have been applied by himself, not by Mr. Hume. It seems to me that it would simplify matters to regard all the birds with prominent crests as Jays.

The Zoological Society of London purchased two specimens in June, 1868, two in May, 1871, two in April, 1873, and others later; it has also found its way into private aviaries, where it has been recognised under the popular name of "The Hunting Cissa."

Swainson's Long-tailed Jay (*Calocitta formosa*).

Blue-grey above, brighter on sides and back of neck; wings bluer and faintly washed with purple, most strongly on the innermost secondaries, the inner webs of which are washed with sky-blue; inner webs of other flights brownish; tail purplish cobalt-blue, distal third of four outermost feathers white; crown bluish-black, with long crest of recurved feathers; lores and feathers above eye bluish-white; feathers encircling eye dusky, a small black spot above the back of the latter; sides of head creamy-white; a broad black band down sides of neck behind the ear-coverts; a bluish-black streak below the eye crossing the cheek; under surface creamy-white; chin slightly bluish; chest crossed by a dull blue crescent, blackish at the sides; flanks purplish-grey; edge of wing greyish-blue; bill and feet black. Female with quite black crest, nape black, back of head washed with blue, probably with shorter, stouter bill than the male. Hab., Mexico,, Guatemala, Costa Rica, Nicaragua, Honduras. (Sharpe.)

Mr. C. F. Underwood (*The Ibis*, 1896) says of this species: "In habits it seems to resemble *Psilorhinus mexicanus;* even the note is very similar, though easily distinguishable." Unfortunately, he does not describe the habits of *P. mexicanus*, so that we are no wiser.

Respecting an allied species (*C. colliei*), Mr. C. W. Beebe says ("Two Bird-lovers in Mexico," pp. 175, 176): "In cry and action they are thoroughly Jay-like, and in curiosity they equal any member of their family. Quietly hidden under thick brush, I often looked forward to an interesting hour's watching of the wild life, when the sharp eyes of one of these inquisitive birds would spy me out, and put an end to all need of concealment in that vicinity. He would shriek and cry his loudest, alarming the most confiding species, and making every bird within a quarter of a mile uneasy and suspicious." "The Jays seem to feed on anything —nuts, seeds, berries, insects, and even small birds, which, apparently paralysed with fear at the shrieks of the blue marauders, were an easy prey."

I have come across no notes on the wild life of *C. formosa*, except that it is said to be very confiding, following one for a mile through the woods. The Zoological Society first secured three examples in 1877, and in 1890 two specimens were purchased for the Gardens; in 1876 the Amsterdam Gardens possessed a specimen, and in 1889 the Berlin Gardens received one from Antwerp.

Himalayan Jay (*Garrulus bispecularis*).

Vinaceous fawn-colour, paler and yellower on the forehead and nasal bristles; lesser wing-coverts vinaceous chestnut; median coverts deeper and blackish at base, the outermost streaked with grey; bastard wing and outer webs of primary-coverts barred black and cobalt; remaining coverts velvet black excepting the innermost, which are chestnut tipped with black; flights black; the primaries with white outer edges, secondaries with about two-thirds of outer web barred with cobalt; upper and under tail-coverts white; tail black, faintly barred with grey towards the base; body below paler than above; a broad black malar streak; throat and abdomen somewhat yellowish; thighs whitish; bill dusky horny; feet dull yellowish; irides red-brown. Female not differentiated; probably with shorter bill than the male. Hab., Himalayas.

According to Jerdon ("Birds of India," Volume II., p. 308): "Adams states that it is common in the lower ranges of the Himalayas, but not in Cashmere; and that its cry is loud and harsh."

Hume ("Nests and Eggs of Indian Birds," Second Edition, Volume I., pp. 28-30) says: "The Himalayan Jay breeds pretty well throughout the lower ranges of the Himalayas. It is nowhere, that I have seen, numerically very abundant, but it is to be met with everywhere. It lays in March and April, and, though I have never taken the nest myself, I have now repeatedly had it sent me. It builds at moderate heights, rarely above 25 ft. from the ground, in trees or thick shrubs, at elevations of from 3,000 to 7,000 ft. The nest is a moderate-sized one, 6 to 8 in. in external diameter, composed of fine twigs and grass, and lined with finer grass and roots.

"The nest is usually placed in a fork.

"The eggs are four to six in number."

"The eggs are rather broad ovals, a good deal pointed towards one end. The ground-colour is pale greenish white, and they are pretty finely freckled and speckled (most densely so towards the large end, where the markings are almost confluent) with dull, rather pale olive-brown, amongst which a little speckling and clouding of pale greyish purple is observable. The eggs are decidedly smaller than those of the English Jay, and few of the specimens I have exhibit any of those black hair-like lines often noticeable in both the English Jay and *G. lanceolatus*. In length the eggs that I have measured varied from 1.1 to 1.21, and in breadth they only varied from 0.84 to 0.87."

Russ says: "This Jay has hitherto only reached the Zoological Gardens of Amsterdam and Berlin. In the year 1896 both H. Fockelmann and A. Fockelmann of Hamburg imported it into the market."

Lanceolated Jay (*Garrulus lanceolatus*).

Pale vinaceous bay, washed with grey; scapulars rather greyer than back; wings black; lesser coverts somewhat greyish; primary-coverts white; bastard wing barred with cobalt towards the base, white at tips; flights white-tipped, especially the secondaries; primaries with grey edge towards the tips, the outer webs of all the flights barred with blue and black; two innermost secondaries grey, with a broad subterminal black bar washed with cobalt on upper edge; tail dull blue (excepting towards the tips of the feathers, where there is a broad white tip, and on the outer feathers) and narrowly barred with black; head, nape and throat

black, streaked with white; fore-neck shading into bluish grey, indistinctly streaked with whitish; remainder of under surface redder than the back, and of a purer vinaceous tint; under wing-coverts greyish black. Female not differentiated; doubtless with shorter bill. Hab., Himalayas.

Jerdon observes ("Birds of India," Vol. II., p. 308): "Hutton says that it is one of the commonest birds of the hills about Simla, usually appearing in small parties of five or six. It breeds in May and June. The nest is made of twigs, roots, and fibres, loosely put together. The eggs, three or four in number, are greenish stone-grey, freckled, chiefly at the larger end, with dusky, and a few black hair-like streaks not always present."

Four examples of this Jay reached the London Zoological Gardens in 1879, and others arrived at the same time in the Amsterdam Gardens; Miss Hagenbeck had a pair in 1884, and in 1885 and 1893 the Berlin Gardens secured specimens.

CANADA JAY (*Perisoreus canadensis*).

Above dull grey, brownish on the mantle; primaries blackish; some of the coverts and the secondaries narrowly white-tipped; tail more slate-grey than black, and white-tipped; nasal bristles and front of crown whitish slightly washed with brown and passing from grey to black on hind crown and nape; orbital plumes streaked with blackish; sides of head, neck and throat white; under parts greyish-brown, whiter on vent; under wing-coverts greyish; bill and feet black; irides dark brown. Female smaller than male. Hab, Canada, Maine, Labrador, to the Yukon. (Sharpe.)

T. G. Cooper ("Ornithology of California," Vol. I., p. 398) says: "They are generally rather shy birds, migrating in small families through the woods, occasionlly whistling in a loud and clear tone quite unlike other Jays. They have, indeed, much the habits and appearance of the Titmice, though so much larger, searching closely among the evergreens for seeds, insects, etc., hanging head downwards and uttering a variety of quaint and musical notes. At times, especially in winter, they become very bold, entering cabins in the woods, and following hunters to obtain scraps of meat and fat of the game he may hang up, from which they have obtained one of their names of 'meat-bird.' They are also called in the Far North 'Whisky Jack,' not from any fondness for liquor, but from a corruption of their Chippewa name of *Wiskachon*. (Suckley.)

"They are most numerous in the cold regions of the far countries north of lat. 49 deg., and do not migrate much even in that climate. According to Hutchings, they in winter become so bold as to steal from the very dishes in the hunter's camp. They lay up stores of berries, etc., in hollow trees, and even are said to eat lichens. They are considered mockers and birds of ill omen by the Indians, and are very noisy about the commencement of storms.

"Their nests are built in pine trees, of twigs and grass, and their eggs, four to six, are light greyish, with faint brown spots. (Nuttall.) The young for the first autumn are nearly as black as Crows."

Russ says that, in the course of years this interesting bird is occasionally offered for sale by the wholesale dealers. The London Gardens first received it in 1867; both Russ and the Zoological Society confound it with the allied Siberian species—*P. infaustus*.

BLUE JAY (*Cyanocitta cristata*).

Above dull greyish-violaceous-blue; greater wing coverts, secondaries, and tail feathers, excepting the middle pair, bright azure blue, tipped with white and barred with black; primaries bright azure externally, the outer ones paler and partly edged with greyish; central tail feathers without white tips, and the outermost feathers without bars; crown and crest lilacine greyish-blue, frontal feathers sometimes with pale or whitish tips; nasal bristles, sides of head and throat lilacine whitish, with black shaft-lines; a black collar on the nape, passing in a line behind the ear coverts down the sides of neck to join a broad crescentic patch across the chest; a narrow frontal band, the lores and a narrow line behind the eye, black; breast, sides and flanks smoky grey; abdomen, vent, and under tail coverts white; under wing-coverts black, washed with purplish blue externally; tips of median coverts and a spot on the edge of the wing white; bill and feet black; irides brown. Female rather smaller, and with a distinctly shorter bill, which, when viewed in profile, is noticeably deeper. Hab., North America.

Major Bendire ("Life Histories of North American Birds," Vol. II., pp. 356-360) says:—"The Blue Jay, one of our best-known birds, is a resident, and breeds throughout the greater portion of its range, but is usually only a summer visitor in the Northern parts of the United States and southern Canada, though even there some are occasionally found in mid-winter in suitable localities where beech nuts and acorns, on which they principally subsist at such times, are abundant.

"The notes uttered by the Blue Jay are quite varied. The ordinary call-note sounds like 'djäh, djäh,' and again like 'käh, käh,' or 'peedunckle, peedunckle,' or 'cable, cable.' I have also occasionally heard them utter a shrill cry resembling that of the Peacock, like 'piüh, piüh,' or 'tiüh, tiüh,' varied now and then to a loud 'pa-há, pa-há.' Occasionally, according to Mr. Preston, it produces one like 'sid-lit, sid-lit,' elevating and lowering the body in unison with this peculiar musical effort. According to Dr. P. L. Hatch, in the 'Birds of Minnesota' (p. 262), 'it utters notes somewhat like "hilly-hilly-hilly," or "p'wilhilly-p'whilly," followed in a minute afterwards by "hweeo-hweeo-hweeo," or "chillœ-chillœ-chillœ," after which comes a soft, sweet, metallic note, filled with a sad pathos.'

"While ordinarily a noisy bird, the careful listener may occasionally be treated to quite a pleasing effort at singing or warbling. Its remarkable powers of mimicry have often been commented on, and it is astonishing how accurately the Blue Jay is able to imitate the various calls, alarm notes, and cries of distress of other birds, and of many mammals as well. These will readily deceive anyone, and the Blue Jay seems to delight in playing tricks on its unsuspecting neighbours in this manner, apparently out of pure mischief. They are especially fond of teasing Owls, and occasionally Hawks also, but sometimes with disastrous results to themselves. While in the woods, they are comparatively safe; but if one ventures into the open, and the Hawk should get tired of its tormentor and turn on him, the consequences are usually serious for the Blue Jay. His flight is laborious, and accomplished only with a good deal of flapping of the wings. He is no match for our smaller Hawks, and even a King-bird never fails to attack a Blue Jay most vigorously should it chance to catch one while flying from one wood to another or come anywhere in the vicinity of its nesting site. The Blue Jay knows this, and stays therefore as much as possible in the timber. They are usually found about the edges of clearings, and not infrequently nest in close proximity to houses, where, if not molested, they become very tame and are soon perfectly at home.

"Their food consists of all sorts of animal matter, offal, insects, grasshoppers, grubs, worms, mice, etc., and, when procurable, the eggs and young of smaller

birds varied with acorns, beechnuts, chestnuts, corn, and fruits of different kinds. They are not at all particular when hungry, but will eat almost anything, and have been seen picking up raw potato peelings, old dried-up apples, etc. Where they are resident they lay up quite a store of acorns, corn, and nuts in various places for winter use, but where they are only summer visitors they do not resort to this practice. In the fall they congregate in large flocks preparatory to their migrations. They usually leave their summer homes in the latter part of September, returning again late in April or early in May."

"Throughout the greater part of the year the Blue Jay is a more or less restless, noisy, and roving bird, moving in little companies from one wood to another; during the nesting season it becomes more quiet and retiring, and is less often seen or heard. It prefers mixed woods to live in, especially oak and beech woods, but for nesting sites dense coniferous thickets are generally preferred; oaks, elms, hickories, and various fruit trees, thorn bushes, and shrubbery overrun with vines are also used, the nests being placed in various situations, sometimes in a crotch or close to the main trunk, or on the extremity of a horizontal limb, among the outer branches. They are placed at distances from the ground varying from 5 to 50 feet, but usually below 20 feet. In the more southern parts of their range nest building begins in the latter part of March, and full sets of eggs may be looked for by April 15. In our Middle States it nests a couple of weeks later, and in the northern portions frequently not before June. I believe but one brood is usually reared in a season, but in the south they may occasionally raise two.

"The nests are generally well hidden, and are rather bulky but compactly-built structures, averaging from 7 to 8 inches in outer diameter by 4 to 4½ inches in depth; the inner cup measures about 3½ to 4 inches in diameter by 2½ inches in depth. Outwardly they are composed of small twigs (thorny ones being preferred), bark, moss, lichens, paper, rags, strings, wool, leaves, and dry grasses, the various materials being well incorporated and sometimes cemented together with mud, but not always; the lining is usually composed exclusively of fine rootlets. Occasionally the Blue Jay will take the nest of another species by force.

"The number of eggs to a set varies from three to six; sets of four or five are most often found, and an egg is deposited daily. Both sexes assist in incubation, which lasts from fifteen to sixteen days. The young grow rather slowly, and are fed on insects, worms, and animal food. They often leave the nest before they are fully feathered, and when scarcely able to fly. At this time they frequently betray their presence by their incessant clamour for food, never appearing to get enough to satisfy their enormous appetites. The parents are exceedingly devoted to them, and are close sitters. Instances have been recorded where a female Blue Jay allowed her head and back to be stroked while sitting on her eggs. The eggs of the Blue Jay vary greatly in their ground-colour. In some this is olive-green, olive-buff, and pea-green; in others it is plain buff colour, or again cream and vinaceous buff. This is irregularly spotted and blotched with different shades of browns and lavender, the markings being generally heaviest about the larger end. A peculiar set of three eggs in the United States National Museum collection has a pale bluish-green ground-colour, with only a few rather large blotches of slate and lavender about the larger end, and one of these eggs is almost unspotted. The shell is smooth, close grained, rather strong, and occasionally slightly glossy. The eggs are usually ovate in shape.

"The average measurements of one hundred and thirty-five eggs in the United States National Museum collection is 28.02 by 20.44 millimetres, or about 1.10 by 0.81 inches."

The London Zoological Society purchased its first example of this bird in July, 1855, since which time many other specimens have been exhibited in the Regent's Park Gardens, and Russ speaks of it as almost always to be met with in Zoological Gardens, though on account of its high price he says it is rarely to be found in private collections. In England it has been occasionally exhibited.

Crowned Jay (*Cyanocitta coronata*).

Back and scapulars above purplish grey or dull ultramarine; lower back and rump azure blue, which becomes still brighter blue on the upper tail-coverts; wings ultramarine; inner secondaries brighter and barred with black; greater wing-coverts also indistinctly barred; tail ultramarine, the inner webs purple-brownish; head and throat dead black, the whole crest dull cobalt or ultramarine blue; the plumes on forehead whitish; chin and throat greyish white; rest of under surface turquoise blue, more purplish on breast; thighs and under wing-coverts greyish black washed with blue; bill and feet black. Female smaller than male. Hab., Highlands of Mexico.

Professor Ridgway regards this and the following as sub-species of Steller's Jay (*Cyanocitta stelleri*), but Dr. Sharpe keeps them separate.

I have found no notes on the wild life of this bird, but they probably would not differ greatly from those of other species in the genus.

The London Zoological Gardens secured two specimens of the Crowned Jay in May, 1890.

Long-crested Jay (*Cyanocitta diademata*).

Above greenish blue, more azure on rump and upper tail-coverts; wings and tail deeper blue, more inclining to ultramarine; the primaries externally somewhat greenish; the secondaries bright cobalt blue; greater wing-coverts, inner secondaries and tail-feathers distinctly barred with black; crown and crest ultramarine blue; the forehead silvery azure passing into bright azure on the front of the crown; nasal bristles and sides of face black; cheeks and ear-coverts washed with blue; a white spot above the eye and a smaller one below it; chin greyish white; rest of under surface pale turquoise, more purplish on throat and chest; thighs purplish; under wing-coverts greyish black washed with blue; bill and feet black. Female smaller than male. Hab., Mexico and Western United States.

J. G. Cooper says that the habits of this species are much like those of *C. stelleri*, respecting which he says ("Ornithology of California," Vol. I., p. 299):—"They show a decided preference for the coniferous forests, rarely going far from them, but sometimes in winter frequenting those of oak. Their food consists of seeds of the pines and spruces, berries and acorns, which they crack before eating, besides insects, eggs, and any animal food they can get. They even eat potatoes in winter, and resort to the shores for dead fish. They are very noisy birds, having a variety of harsh notes and a considerable talent for mimicry. They are sometimes very bold and prying, at others very cautious and suspicious, soon learning the effect of a gun, and showing much sagacity in their movements.

"Their nests are built usually in evergreens at various heights, large, and composed of twigs and roots, with a layer of mud and a lining of root-fibres. The eggs, about four, are pale green, with small olive-brown specks, and others inclining to violet. (Nuttall.)

"They lay in May near the Columbia River, and probably a month earlier in some parts of this State."

I have the less hesitation in quoting the above in full, because Ridgway regards *C. diademata* as a mere sub-species of Steller's Jay. Russ says that in 1889 L. Ruhe, of Alfeld, imported about twenty head of this Jay into the market, and therefore he thinks it quite likely that the introduction of the species to the bird-loving public may sooner or later be repeated.

PILEATED JAY (*Cyanocorax chrysops*).

In size as large as a Magpie, but with a shorter tail. In colouring it chiefly differs from *C. cyanopogon* in having the nape blue; the back, wings, and exposed parts of the tail feathers (with the exception of the broad white tips), glossed with purple; the crest is much more rounded; the iris, whitish yellow. Female with bill, viewed from above, distinctly broader than that of the male, but about the same length. Hab., Southern Brazil, Uruguay, and Paraguay.

Burmeister says that this bird lives in pairs like our Magpie, nests somewhat inartistically upon high trees, lays two bluish-white, brown-spotted eggs, and feeds on

PILEATED JAY.

grain or insects according to the time of year. Mr. White, speaking of it as observed by him in Argentina, says: "It is remarkably tame and inquisitive, and has a great variety of peculiar grating metallic notes." Azara says: "It is abundant in Paraguay, and familiar with men, coming a great deal about the houses."

Hudson ("Argentine Ornithology," Vol. I., p. 110) observes:—"This Blue Jay is very common about the woods at Campo Colorado (Salta)." He calls it the "Urraca Jay."

This is a familiar species at bird-shows, and is perhaps even more freely imported into Europe than *C. cyanopogon*. It first reached the London Zoological Gardens in February, 1865, an example being presented by Mrs. Laird Warren; a second example was presented by Mr. E. B. Webb in December, 1872, and two were purchased in July, 1875; many other examples have been acquired since that date. On several occasions it has reached the Berlin Gardens, and several private aviculturists have had specimens. In 1907 Mr. H. C. Martin published some notes on the habits of this species in *The Avicultural Magazine*, New Series, Vol. V., pp. 33-39; he brought home two specimens from South America, and kept them for some time in captivity. They soiled the white plumage of their underparts by bathing and then hopping about on the earth floor, which proves the truth of my view that sea-sand alone should be used on the floor of flight-cages and aviaries.

BLUE-BEARDED JAY (*Cyanocorax cyanopogon*).

The forehead, crest, sides of head, chin, throat, and edges of anterior breast feathers are jet black. Above the eye is a bright pale blue corona, and below the eye a slightly sinuous deeper blue streak; from the lower mandible backwards a broad bright ultramarine moustache-like patch. The back of crown and nape are densely clothed with long lavender-whitish feathers, which are erected simultaneously with the black crest on the front of the crown; back slaty vinous brown, becoming blacker on the wings, the flights and tail being almost black, the latter broadly tipped with white; under parts from the breast backwards snow

HEAD OF BLUE-BEARDED JAY IN REPOSE.
With crest and feathers of nape erected.

white (usually discoloured in cabinet specimens, and therefore described as creamy), a few of the hinder flank feathers blackish; bill and feet black, iris amber yellow. Female not differentiated, but probably with a broader bill (viewed from above) than the male. Hab., Amazonia, Columbia, and Guiana.

According to Burmeister, this species has the same habits as the European Jay, and, like it, feeds upon insects as well as dry seeds, more particularly those of forest trees. It is probable that its habits more nearly resemble those of *Cyanocorax chrysops*.

The same author says:—"The male is more lively in colouring than the female, and the nape especially is not pure white but pale sky-blue, which colour runs down the sides of the neck to the breast; the young bird resembles the female and may be distinguished from it by the small crest." The colouring, however,

is hardly pale sky-blue, because there is a suspicion of red in it which gives it a pearly-lavender hue. This is one of the least expensive and most charming of all the imported *Corvidæ*.

I purchased an example of this species early in 1895 in rough plumage, and have never regretted it. At first it was ragged, dirty, and somewhat shy, but it soon became wonderfully confiding and absolutely perfect in plumage; it is no mimic, but will fly to me when I call it and let me tickle and scratch it where I please. Sometimes it puts down its head, stretches its neck, does a sort of staid dance up and down the perch, singing a weak, crooning sort of song, and turning its head from side to side. It has several far-reaching cries, one of which is almost metallic, whilst another is almost like the yelp of a dog. Like all the Jays, this species is very fond of bathing, so that (excepting when in full moult) its plumage is always clean and silky. If talked to, the bird sits still near to the wire and erects its crest and the feathers of the nape, puffing out the breast feathers; then, if tickled on the side of the breast, it gradually raises its neck until all the feathers show separately. As a rule, it objects to showing off before strangers, but if they remain for an hour or two in the place its confidence is restored. It is always in perfect health, and never shows bare patches even when moulting. Respecting its longevity if properly looked after there can be no question; for, as I write, my bird (after more than fourteen years) is as vigorous and healthy as it ever was.*

Black-headed Jay (*Cyanocorax cyanomelas*).

Violaceous brown; wings and back pale brown, slightly violaceous; upper tail-coverts purplish-blue; tail deep purple; frontal plumes velvety; lores blackish; sides of head and throat darker brown than the body; breast, under wing-coverts and abdomen washed with violet, becoming violaceous blue on under tail-coverts. Female not differentiated, probably with thicker bill (viewed from above). Hab., Brazil.

I have found no notes on the wild life of this species. An example reached the London Zoological Gardens in 1879, and another was exhibited the same year at the show of the Ægintha Society in Berlin; later, it was received at the Berlin Gardens.

Azure Jay (*Cyanocorax cæruleus*).

Deep smalt-blue, brighter and more cobalt on the rump and upper tail-coverts; tail deep blue; inner webs of flights more or less black; head, neck, and throat to upper part of breast, black; the back of crown washed with blue; bill and feet black. Hab., S. Brazil, Paraguay, and North Argentina.

White says that he found this bird at times in flocks, that it makes a great noise, but is exceedingly wild and difficult to shoot.

Mr. J. Graham Kerr (*The Ibis*, 1892, pp. 128, 129) has the following observations on its habits:—"Very common in the hardwood forests, and occasionally straying out into the open. It has been described as being extremely shy, but I found this to be the case only with the scattered individuals one sees outside the limits of the forest. Within the forest, where it is usually found in company with *C. chrysops*, it even exceeds its companion in boldness and curiosity. It is always the first to catch sight of a stranger within the forest, hopping about in the branches all round him, peering at him curiously, and all the while raising an alarm with harsh cries—*caa-caa-caa*. The natural boldness of the bird was well shown by the behaviour of one shot in the wing by Col. Racedo and given to me. The wing was shattered at the carpal joint, so I snipped off the entire manus and dusted iodoform over the wound to stop the bleeding. The bird remained for several hours very weak from shock and loss of blood, but next morning was again quite lively. It hopped about with the utmost confidence, ate and drank out of my hand, and finally had the presumption to jump up on my knee and begin to tear pieces of flesh out of a bird which I was dissecting at the time.

"When out in the open, on the other hand, this species is exceedingly wary and difficult of approach.

"The flight of *C. cæruleus* is very weak and undulating, and its voice is restricted to a harsh scream, not possessing the variety of that of *C. chrysops*."

Russ says that this species arrives in the market rarely and singly. In 1879 it reached the Zoological Gardens of Amsterdam. The traveller Mangelsdorff brought it home with him from Brazil in 1889; Miss Hagenbeck imported it in 1891 and 1894, and in the latter year it was to be seen in the Berlin Zoological Gardens.

Peruvian Jay (*Xanthura incas*).

Above yellowish-green; wings darker, the flights bronzy towards tips of outer webs; tail bright yellow, excepting the two central feathers, which are deep blue-green; crown pale yellow, with opaline tints; hind neck bright yellow; nasal bristles, frontal plumes, a spot above eye, feathers below eye and cheeks deep blue; remainder of sides of head black; chin slightly bluish; body below, from lower throat backwards, bright yellow. Female not differentiated, probably differing as in the species of *Cyanocorax*. Hab., Western South America, from Peru to Ecuador.

According to T. K. Salmon ("Proceedings of the Zoological Society," 1879, p. 510), this Jay "has much the habits of the English Jay, being ever on the move and seldom silent, except when near its nest or when at mischief. It robs the Indian corn-fields before the grain is ripe, but at other times subsists on grubs and insects. The nest is made of sticks and roots, and is placed in a high bush. The number of eggs is four.

"Eggs, greenish-grey, thickly mottled with darker shades of the same colour; axis 1.15, diameter .85."

Two specimens of this species reached the London Zoological Gardens in June, 1872. It is called Peruvian Blue Jay by the Zoological Society, and Peruvian Green Jay by Russ; I think the best compromise is to drop the colour altogether, as it is mostly yellow.

Mexican Jay (*Xanthura luxuosa*).

Green; back and upper tail-coverts slightly bluish; secondaries darker green; tail feathers mostly yellow washed with green at base, the four central ones green, the two central ones bluish; crown deep blue, including nasal bristles and frontal plumes, behind the latter a band of white feathers; sides of head and lower neck black, the latter with green tips to the feathers; front of cheeks and a small patch above and below back of eye blue; under surface paler green than the upper; under wing-coverts bright yellow; bill black; feet lead-colour. Female not differentiated. Hab., Texas, southward to Mexico.

Captain Bendire ("Life-Histories of North American Birds," Vol. II., pp. 383-385) publishes the following notes on the life-history of this Green Jay:—"Mr. D. B. Burrows, writing me from Roma, Texas, says,

* It died, after two or three days' illness, on the 10th September, 1909, unfortunately in poor plumage, not having feathered properly after its moult.

'These birds are common a few miles below Rio Grande City, but are never seen above this place.'

"The 'Pajaro verde,' as this bird is called by the Spanish-speaking population of this region, is a common resident throughout the heavier timbered river bottoms and the chaparral bordering the Rio Grande, especially in the vicinity of Hidalgo and Lornita, and breeds wherever found.

"Dr. James C. Merrill, United States Army, in speaking of this species, says: 'The Rio Grande Jay is a common resident about Fort Brown and higher up the river, but does not seem to pass much into the interior of Texas. It is a noisy and gaudy species, soon making its presence known by its harsh cries or by its green and yellow plumage, seen for a moment as it moves about. Though at times shy, it is often very tame and bold, entering tents and taking food off of plates or from the kitchen, whenever a good opportunity offers. Large numbers are caught by the soldiers in traps baited with corn, but their plumage is their only attraction as a cage-bird.'

"There is little or no difference in the general habits of the Green Jay from those of the other members of the family.

"Mr. George B. Sennett says: 'Of all the birds on the lower Rio Grande, this is the most mischievous, robbing and despoiling other birds' nests without mercy.'

"Very little has as yet been recorded regarding the food of this Jay, excepting what I have already mentioned, but it is presumable that it does not vary much from that of our better-known species. The nesting season commences early in April and lasts through May. The first nest and eggs brought to the attention of naturalists, as far as I am aware, are those taken by Dr. Merrill on May 27, 1876, near Edinburg (now Hidalgo), Texas, about seventy miles above Fort Brown, on the Rio Grande, and recorded in the 'Bulletin of the Nuttall Ornithological Club,' 1876 (Vol. I., p. 89). This is described as follows: 'It was placed on the horizontal branch of a waican tree, about 25ft. from the ground, and was built of twigs and rootlets. The cavity was slight, and the entire structure so thin that the eggs could be seen through the bottom. They were three in number and quite fresh.'

"Two nests now in the United States National Museum collection resemble the above, and are frailer than any other Jays' nests I have ever seen. They do not always build such slight structures, however. Mr. Sennett describes one as follows: 'The nest of the Jay was some 9ft. from the ground, on the outer branches of a small tree, and composed wholly of sticks and fine twigs. The sticks were so full of thorns that when they were crossed about among the living branches more firmness was given to the nest than usual, and by cutting off the branches I could readily take it entire. The outside diameter is 9 inches one way by 8 the other; its depth is 4 inches; inside it is 3½ inches wide by 2 inches deep.'

"The nests are generally placed in dense thickets and well hidden among the branches at heights varying usually from 5 to 10 feet from the ground, and rarely in large trees. They are frequently found in retama, anacahuita, brasil, and hackberry bushes or trees. The outer nest consists usually of a slight platform of small thorny twigs and branches, sparingly lined with fine rootlets, small pieces of a wire-like vine, bits of moss, and occasionally dry grass and leaves. The Green Jay apparently does not use mud in the construction of its nest. The earliest breeding record I have is April 3, and the latest is May 26. The breeding season is at its height during the last week in April and the first week in May. It is probable that two broods are sometimes raised in a season. The length of incubation is not likely to vary more than a day of so from that of our better-known Jays.

"The number of eggs laid by this species is from three to five; sets of four are most often found. The prevailing ground colour of these eggs is grayish-white, occasionally pale greenish-white or buff colour. They are profusely spotted and blotched—but never heavily enough to hide the ground colour—with different shades of brown, gray, and lavender; these markings are generally more abundant about the larger end of the egg. The shell is close-grained, moderately strong, and shows little or no gloss. Their shape is mostly ovate, and sometimes short ovate.

"The average measurements of seventy eggs in the United States National Museum collection is 27.31 × 20.43 millimetres, or about 1.08 × 0.80 inches. The largest egg of the series measures 30.78 × 21.84 millimetres, or 1.21 × 0.86 inches; the smallest, 24.89 × 19.30 millimetres, or 0.98 × 0.76 inch."

The London Zoological Society purchased three examples of this Jay in December, 1876; then for a time it was occasionally seen in the market. Later it arrived in greater numbers in the hands of the wholesale dealers, its price in Germany being from 20 to 30 marks for a specimen; now, under the existing restrictive laws, it is bound to become very rare in the trade.

Beechey's Jay (*Xanthura beecheii*).*

Above purplish or smalt blue, brighter on rump and upper tail-coverts; quills black internally, with the exception of the inner secondaries; head, nape, hind neck and under surface black; thighs, under wing and tail-coverts purplish-blue; bill black or yellow; feet yellow; irides yellow. Female smaller than male; bill yellow; irides grey. Hab., N. W. Mexico.

Russ says of this species:—"Reiche, of Alfeld, near Hanover, imported it alive in the year 1886, and sent me the female for identification. In the same year this species reached the Amsterdam Zoological Gardens." He says that Grayson met with it commonly in low bushy forest, which it seemed to prefer to the higher woods in some parts of the country.

Yucatan Jay (*Xanthura yucatanica*).

Above deep turquoise blue, inner secondaries somewhat greener; tail deeper blue; head, neck, and under surface black, passing into dull blue on under tail-coverts; bill black; feet yellow, irides probably yellow. Female smaller according to Sharpe, larger according to Ridgway. Sharpe's female with yellow bill and white-tipped tail-feathers represents Ridgway's immature birds. Hab. Yucatan, British Honduras, Eastern Guatemala, South-eastern Mexico.

The London Zoological Gardens acquired two males in 1884 and two females in 1886.

Hartlaub's Jay (*Xanthura melanocyanea*).

Above uniform greenish blue, varying almost to cobalt blue in certain lights; tail darker and more purplish, less greenish; head, neck, chest, and breast black; rest of under surface dull grey-greenish blue; bill and feet black; (or yellow, Ridgway); irides yellow (red, Sharpe). Female larger, according to Ridgway. Hab., Highlands of Guatemala, Salvador, Honduras and Chontales, Nicaragua.

A woodland bird which, according to Salvin and Godman, breeds in April and May, and forms a loose nest of

* Ridgway refers this species to the genus *Cissilopha*.

small twigs in a thick bush at about two feet above the ground. Usually four eggs represent a clutch, they are brick red with darker spots.

Reiche, of Alfeld, imported this Jay in 1886, but it had previously reached the Amsterdam Gardens in 1881. In 1887 Miss Hagenbeck exhibited a pair at the show of the "Ornis" Society in Berlin.

TRICOLOURED JAY (*Uroleuca cyanoleuca*).

Above mostly rich violet, but the mantle and back violaceous brown; inner webs of primaries and outer secondaries blackish-brown; edges of primaries dull blue; apical half of tail pure white; head and neck brown; a prominent recurved frontal crest; lores, orbital feathers, and cheeks dark brown; under surface from neck backwards creamy white; under wing-coverts white; edge of wing blue; bill and feet black; irides greyish-brown. Hab., Brazil.

According to Burmeister ("Systematische Uebersicht," Vol. III., p. 286):—"Not rare on the Campos region of inner Brazil; yet one sees this bird only singly in the open scrub of the Campos serrados, where it comes quite close to the settlements, yet does not lightly adventure into the gardens."

This is all I have been able to discover respecting the wild life of the species. It reached the Zoological Gardens of Amsterdam in 1872; but otherwise seems not to have been imported.

Dr. Sharpe includes the genus *Struthidia* in this family; but, following the Zoological Society's List, I have already dealt with it under the expansive assemblage forming the family *Crateropodidæ*.

WHITE-WINGED CHOUGH (*Corcorax melanorhamphus*).

Sooty black, slightly purplish; flights with greenish gloss on outer webs; inner webs of primaries, excepting at base and tip, white; bill and feet black; irides scarlet. Female smaller than male. Hab., Australia.

Gould observes ("Handbook of Birds of Australia," Vol. I., pp. 470-472):—"This bird is distributed over all parts of New South Wales and South Australia; it is very abundant in the whole of the Upper Hunter district, I killed it in the interior of South Australia; and Mr. Elsey met with it at the edge of a dense scrub on the Burdekin in lat. 19° 30′ S. It usually occurs in small troops of from six to ten in number, feeding upon the ground, over which it runs with considerable rapidity. In disposition it is extremely tame, readily admitting of a very close approach, and then merely flying off to the low branch of some neighbouring tree. During flight the white marking of the wing shows very conspicuously, and on alighting the bird displays many curious actions, leaping from branch to branch with surprising quickness, at the same time spreading the tail and moving it up and down in a very singular manner; on being disturbed it peeps and pries down upon the intruder below, and generally utters a harsh, grating, disagreeable and tart note; at other times, while perched among the branches of the trees, it makes the woods ring with its peculiar soft, low, very pleasing but mournful pipe.

"During the pairing-season the male becomes very animated, and his manners so remarkable that it would be necessary for my readers to witness the bird in its native wilds to form a just conception of them; while sitting on the same branch close to the female, he spreads out his wings and tail to the fullest extent, lowers his head, puffs out his feathers, and displays himself to the utmost advantage, and when two or more are engaged in these evolutions, the exhibition cannot fail to amuse and delight the spectator. A winged specimen gave me more trouble to catch than any other bird I ever chased; its power of passing over the ground being so great, that it bounded on before me and cleared every obstacle, hillocks and fallen trees with the greatest facility.

"The white-winged Corcorax is a very early breeder, and generally rears more than one brood in a year, the breeding-season extending over the months of August, September, October, and November. The nest is a most conspicuous fabric, composed of mud and straw, resembling a bason, and is usually placed on the horizontal branch of a tree near to or overhanging a brook. The eggs vary from four to seven in number, and are of a yellowish white, boldly blotched all over with olive and purplish brown, the latter tint appearing as if beneath the surface of the shell; they are one inch and a half long by one inch and one line broad.

"It has often struck me that more than one female deposited her eggs in the same nest, as four or five females may be frequently seen either on the same or the neighbouring trees, while only one nest is to be found.

"The bird generally evinces a preference for open forest land, but during the breeding season affects the neighbourhood of brooks and lagoons, which may be accounted for by the fact of such situations being necessary to enable it to procure the mud to build its nest, besides which they also afford it an abundance of insect food."

The London Zoological Gardens secured its first specimen of this species in May, 1866, and two others in June, 1875. The Amsterdam Gardens acquired it in 1865; Reiche, of Alfeld, imported it in 1893 and 1894, and it reached the Berlin Gardens in 1895.

I have not included the Huia Bird (*Heteralocha acutirostris*), from New Zealand, as it is now not very likely to come into the market. Formerly there was a specimen at the London Gardens, deposited there by the late Sir Walter Buller.

The Piping and Butcher Crows are now usually referred to the neighbourhood of the Shrikes; but it is more convenient to follow the list of the Zoological Society, and place them at the end of the present family. Their general aspect is far more Crow-like than Shrike-like, and, as we well know, the Piping Crows are recognised in their native country as Magpies.

Piping Crows, etc. (*Gymnorhininæ*).

These are birds of considerable bulk, with long, somewhat cylindrical, tapering bills of great strength. In the males the bills are very much longer and proportionally more slender than in the females, as I have proved by the examination of a series of partially sexed skins. I am also inclined to believe that, although it may be possible for old wild hens sometimes to assume the male dress (even as in captivity they sometimes fail to lose the spotted juvenile plumage), the normal colouring of the sexes of adult birds differs considerably. I base this opinion upon the fact that, whereas in skins which had been sexed when prepared by the collector all the undoubted females differed in length of bill and colouring from the males; in all the unsexed specimens, if separated by either character, the same individuals came together.

The Piping Crows are principally ground-feeders, like our Rooks; their food consists chiefly of grasshoppers and other insects, supplemented by small fruits and berries; in captivity, however, they will eat raw meat, mice, and dead birds in addition to other food; therefore it is probable that in their wild state they, like

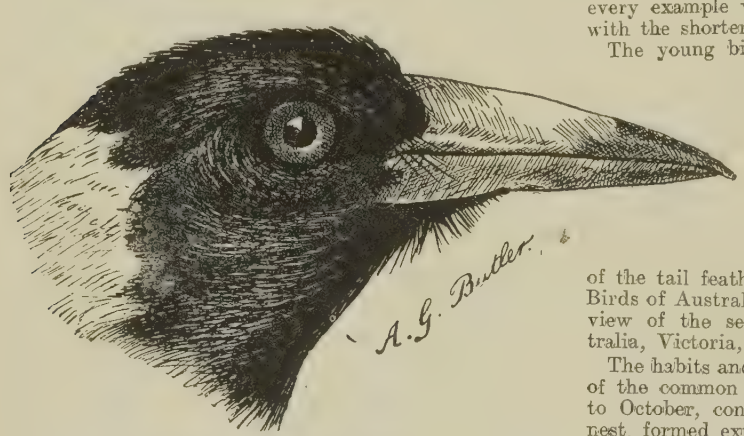
the true Crows, sometimes devour the eggs and young of other birds.

COMMON PIPING CROW (*Gymnorhina tibicen*).

"Crown of the head, cheeks, throat, back, all the under surface, scapularies, secondaries, primaries, and tips of the tail feathers black; wing-coverts, nape of the neck, upper and under tail-coverts, and base of the tail feathers white; bill, bluish ash-colour at the base, passing into black at the tip; irides rich reddish hazel; legs black." (Gould.)

This is a description of the male, but the fact that the black of the upper parts has a bluish, and that of the under parts a greenish, gloss is not mentioned.

In the British Museum catalogue Dr. Hans Gadow describes what he thinks may be a younger specimen, having "the neck-patch less distinct, the feathers on the hinder part mottled with black; feathers of the back with white edgings; rump feathers with black bases, only the tips being white, producing a strongly mottled appearance." Yet he describes the young bird as having the "top of the head, wings, and terminal part of the tail brownish-black; the feathers of the back blackish, narrowly tipped with grey; the whole under surface of the body brown, mottled with darker brown and whitish"; so that the supposed "younger specimen" is neither like the adult cock nor the young bird. Is it safe to assume, from an examination of eight skins, (one of which is undoubtedly young), that the sexes of this bird do not differ? Hab., New South Wales and N. Australia, excepting the coast.



WHITE-BACKED PIPING CROW.
Head of female.

In its wild state this Piping Crow frequents open tracts of country, particularly when skirted by belts of trees, in the forks of the branches of which it constructs its nest. Dr. Ramsay says that the latter is a large open structure of sticks and twigs lined with grass and hair. The eggs are three or four in number, and, according to Mr. North, are very variable, being usually green or blue, spotted and streaked with various shades of reddish-brown and lilac; but sometimes they are dull dark brown, dotted all over with darker brown, and sometimes "brownish-white, with spots and dashes of wood-brown tinged with lilac and obsolete lilac spots at the larger end."

The favourite food of this bird, in a state of freedom, consists of locusts and grasshoppers, but in captivity all kinds of animal food are accepted. My friend Mr. Housden had a fine male for many years which had a good-sized aviary to itself—indeed, I do not think any other bird could safely be associated with it. It is imported fairly frequently, but is never very cheap. The London Zoological Society first acquired it in May, 1888, and has secured various other specimens since, the last recorded in Vol. IX. of the "List of Animals" having been presented in March, 1895.

The notes of this and the allied species are singularly clear, loud, and musical; in this respect they differ a good deal from our native Crows, although some of the latter can be trained to whistle well.

WHITE-BACKED PIPING CROW (*Gymnorhina leuconota*).

This bird is tolerably nearly allied to the preceding, but differs in the male having the whole back pure white, like the neck and rump; the bill is bluish-lilac, shading into black towards the tip; feet blackish-grey; irides light hazel.

The female, in my opinion, is represented by specimens with shorter, stouter bills and greyish neck and back. These are generally described as young birds, but a very old female, of which I have the skin (the sex was conclusively proved by dissection), not only has the nape and back grey, but mottled like a young bird; moreover, the grey colouring is always found, in every example which I have examined, in conjunction with the shorter and stouter bill.

The young bird is brownish-black where the adults are black, the back being greyish and spotted with white, the lower parts of the abdomen whitish.

Hans Gadow regards *G. organica* = *hypoleuca* (Tasmanian Piping Crow) as a smaller race of the same species, and Gould says of it that "the female differs in having the nape of the neck and back grey, and the primaries and tips of the tail feathers brownish-black ("Handbook of the Birds of Australia," Vol. I., p. 179), thus confirming my view of the sexual differences. Hab., South Australia, Victoria, New South Wales, and Tasmania.

The habits and food of this species are similar to those of the common Piping Crow. It breeds from August to October, constructing a large and deep cup-shaped nest, formed externally of sticks and lined with twigs, grasses, and cow-hair, and placed in the fork of a tree, sometimes at a considerable height from the ground in a eucalyptus, at other times in a sapling at about 20ft. altitude; Mr. North even took the nest at 10ft. from the ground. Three eggs are laid, varying from bluish or greenish white to apple-green, streaked, spotted, or smudged with reddish-brown or wood-brown, but sometimes minutely speckled all over with pale reddish.

According to Gould, this bird is more shy than the common Whistling Crow.

Though imported pretty regularly, it is never very cheap. The Zoological Society of London acquired two examples in 1862; in 1863 ten specimens were deposited at the Gardens, and two of the Tasmanian race were presented; in 1866 a specimen of the typical form was deposited, and in 1869 a specimen of the Tasmanian race, and since that date over a score of specimens have been added to the menagerie, the latest recorded in the ninth edition of the "List of Animals" having been presented in 1895.

PIED BUTCHER-CROW (*Cracticus picatus*).

Upper back and scapulars black, but the uppermost of the latter grey at base; lower back greyish; rump and upper tail-coverts white; lesser and median wing-coverts white, many of them black at base; greater and primary coverts black on inner web, mostly white on outer web; flights black, the primaries with a white spot near base of outer web; outer secondaries black on outer and white on inner web, three inner secondaries entirely white; central pair of tail-feathers black, the remainder with broad white tips, some of them with a large white spot at base of outer web; head and neck, throat and chest black; a white collar round hind neck; under surface from chest backwards white; bill lead colour, black at tip; feet black; irides brown. Female not differentiated, but doubtless differing in the character of its bill. Hab., Northern Australia. According to Dr. Gadow, this is only a smaller race of *C. nigrigularis* which inhabits Southern and Eastern Australia up to Rockingham Bay.

Gould observes ("Handbook to the Birds of Australia," Vol. I., p. 181):—"Gilbert, who found it at Port Essington in considerable abundance, states that it is an extremely shy and wary bird, inhabiting the most secluded parts of the forest, and is as frequently seen searching for its food on the ground as among the topmost branches of the highest trees. In its habits, manners, mode of flight, and in its loud, discordant, organ-pipe-like voice, it closely resembles the other members of the genus. It is usually seen in pairs, or in small families of four or five. Its nest is built of sticks in the upright fork of a thickly-foliaged tree, at about 30 ft. or 40 ft. from the ground. The stomach is muscular, and the food consists of insects of various kinds, but principally of coleoptera."

Campbell ("Nests and Eggs of Australian Birds," p. 302) thus describes the nest and eggs of this species:—"*Nest.*—Open, composed of sticks, lined with small twigs and rootlets, and generally placed high in a large tree. Dimensions over all, 6 in. by 4 in. in depth; egg cavity, 3½ in. across by 2 in. deep." (Le Souëf.)

"*Eggs.*—Clutch, three usually; inclined to pear-shape or pyriform; texture of shell comparatively fine; surface glossy; colour, light or pale olive-brown, blotched, especially about the apex, with umber and dull brown, with sometimes here and there an ink-like dot. Dimensions in inches of a proper clutch: (1) 1.19 × .89; (2) 1.18 × .88; (3) 1.16 × .86."

The London Zoological Society received an example of this species, by exchange, in May, 1888.

LONG-BILLED BUTCHER CROW (*Cracticus destructor*).

General colour above dark brownish-ash with darker brown streaks; a few scapular feathers with whitish patches; upper tail-coverts white; wings blackish-brown; three of the inner secondaries narrowly edged with white on outer and inner webs; tail black, all except the two central feathers tipped with white on inner web; head and neck black; a white loral patch extending to the eye; under surface greyish-white; bill bluish lead-colour, becoming black at tip; feet blackish lead-colour; irides dark reddish-brown. Female browner and more dingy, the sides of breast more uniformly tinged with pale brownish-grey; flanks pale brownish-grey. Hab., South Australia.

Gould says ("Handbook," Vol. I., pp. 184-186):—"This bird is a permanent resident in New South Wales and South Australia, where it inhabits the margins of the brushy lands near the coast, the sides of the hills, and the belts of trees which occur in the more open parts of the country; in fact, I scarcely know of any Australian bird so generally dispersed. Its presence is at all times betrayed by its extraordinary note, a jumble of discordant sounds impossible to be described. It is nearly always on the trees, where it sits motionless on some dead or exposed branch where it can survey all around, and particularly the surface of the ground beneath, to which it makes perpendicular descents to secure any large insect or lizard that may attract its sharp and penetrating eye; it usually returns to the same branch to devour what it has captured, but at times will resort to other trees and impale its victim after the manner of the true Shrikes; mice, small birds, and large *Phasmidæ* come within the list of its ordinary diet. September and the three following months constitute the period of incubation. The nest, which is large and cup-shaped, is neatly formed of sticks, and in some instances beautifully lined with the shoots of the *Casuarina* and fibrous roots. Considerable difference is found to exist in the colour of the eggs, the ground-colouring of some being dark yellowish-brown, with obscure blotches and marks of a darker hue, and here and there a few black marks, not unlike small blots of ink, while in others the ground-colour is much lighter, and the darker markings are more inclined to red and to form a zone round the larger end; the eggs are generally three in number, one inch and three lines long by eleven lines broad.

"Under ordinary circumstances this species is very shy and retiring, but at times is altogether as bold, as an evidence of which I may mention that, having caught a young *Eöpsaltria* and placed it in my pocket, the cries of the little captive attracted the attention of one of these birds, and it continued to follow me through the woods for more than an hour, when the little tenant, disliking its close quarters, effected its escape, and flitted away before me. I immediately gave chase, but the Crow-Shrike, which had followed me, pounced down within two yards of my face, and bore off the poor bird to a neighbouring tree, and, although I ran to the rescue, it was of no avail, the prize being borne away from tree to tree, until the tyrant paid the forfeit of his life by being shot for his temerity."

The first example of this species to reach the London Zoological Gardens was presented in May, 1863; a second was deposited in July, 1866, and two others were purchased in 1867 and 1872; others were received later, the last specimen recorded in the ninth edition of the List being deposited in January, 1894. It has also been represented in the Berlin Gardens, and from time to time Miss Hagenbeck, of Hamburg, has imported specimens.

CHAPTER V.

LARKS (*Alaudidæ*).

The Larks represent a small family, of which about seventy-three distinct species are recognised. These are distributed into no less than twenty-one genera. With one exception they are confined to the Old World, six species being recognised as having a claim to the title of British bird.

Larks are mostly powerful fliers, with long, wide, and pointed wings, the males usually having the first long flight feathers more developed than the females, and the breastbone, with the pectoral muscles, consequently deeper and more powerful. On the earth these birds progress by walking. They never wash, but cleanse themselves by squatting on the ground and throwing dust or sand through their feathers, after the manner

of gallinaceous birds. Their food consists of spiders, centipedes, all kinds of small insects with their larvæ and pupæ, and seeds of weeds or grain. From the Pipits, which they much resemble in colouring, and to which they are undoubtedly nearly related, the Larks can be at once distinguished by the scaling at the *back*, as well as the front, of the foot.

Very few species of Larks are imported as cage-birds, probably because of their modest colouring; but such as do come to hand are well worth keeping, though, unfortunately, they are never cheap. Dr. Russ only records ten imported species, several of which are not exclusively foreign birds; whilst the Zoological Gardens of London, including British and European species, has only kept seventeen, and one of these—*A. gulgula* (the Indian Skylark)—is only doubtfully distinct from our British bird. Of the few imported species, the Tientsin and the Calandra Larks are undoubtedly most often seen in the market, and are by far the most attractive. With a good insectivorous mixture, a teaspoonful daily of canaryseed, a little green food, a few living insects or their grubs, and an occasional spider, Larks are easily kept in health, provided that a fairly large cage or a small aviary is made use of in which to confine them. Only one male should be kept in the enclosure, as Larks are naturally pugnacious towards their own kind. They are, as a rule, confiding and long-lived, and the songs of many of them are especially pleasing.

In Russ' "Fremdländischen Stubenvögel," descriptions are given of nearly all the Larks known to him, whether imported as cage-birds or not; in some cases only a single skin of the species was known to him as existing in a museum. I see no object in thus unnecessarily extending the size of a book for the use of aviculturists. Of course, it caters for future generations which may (or may not) possess living examples of some of these species, but a later edition by a writer of a later generation would probably answer the purpose better.

Clot-bey Lark (*Rhamphocorys clot-bey*).

Above sandy buff, greyer on the nape; primaries dark brown, especially at the tips; secondaries blackish with white tips; central tail-feathers reddish-buff, brown at tips; remaining tail-feathers white with broad, black-brown tips decreasing outwardly; crown indistinctly streaked with grey; lores and ill-defined eyebrow stripe blackish; ear-coverts and sides of neck black, the former with a white central spot; chin, middle of throat, and breast white, the latter densely spotted with black, which unites behind into a broad central stripe on the upper abdomen; lower abdomen and under tail-coverts white; sides and flanks vinous buff; bill bluish; feet white; irides dark brown. Female smaller, paler, and more uniformly buffish, the under surface less black. Hab., Deserts of Lybia and Algeria.

J. I. S. Whitaker ("Birds of Tunisia," Vol. I., pp. 289-291) says: "Peculiar in its appearance, this Lark is equally so in some of its habits, and differs not a little from most other Larks. As a rule it frequents rocky hillocks and broken, undulating country covered with a scanty scrub vegetation, this being often so scanty as hardly to afford shelter to the bird. In such localities the species is to be found generally in limited numbers, though occasionally fairly plentifully. In springtime, when I have met with the species, it has been in pairs, but during the autumn and winter it appears to congregate together, and is then to be found in small flocks. On the few occasions when it has been my good fortune to encounter the bird, I have found it far from shy, and instead of flying off on my approach it has allowed me to walk close up to it before taking to flight. On one particular occasion I remember observing one of these birds, which had evidently seen me from a distance coming towards it, crouch down as closely as it could to the bare ground, remaining there motionless, with its head turned towards me, watching me as I slowly walked up to it, and it was only on my approaching within a yard of the spot where it was that it finally took to its wings. The species evidently does not readily take to flight, but seeks to escape detection by concealment and, according to some observers, by running off on the approach of danger, like some other Larks, such as *Chersophilus duponti* and *Alæmon alaudipes*. When the present species *does* use its wings it rarely takes a long flight, but skims over the surface of the ground for a short distance, and then settles down again. Its flight, however, is by no means feeble, but the contrary, and, should a strong wind happen to be blowing, it is, indeed, rather swift and somewhat darting. Though not shy, this Lark seems to be generally on the alert, and I have seen it perching on a low rock or stone spying the country round it, after the manner of a Chat.

"The food of the species consists of small seeds and insects. In the crop of one of these birds I found a locust almost entire, and in that of another a good-sized beetle, minute seeds being also present in both cases.

"I have never heard this Lark's note, but, according to Dr. Koenig, the bird emits a Lark-like twitter when on the wing, though he never heard it utter any real song. To the same author we are indebted for some interesting notes regarding the breeding of this species, together with an excellent plate of a brooding female, with its nest and eggs ("Journal für Ornithologie," 1895, p. 263, pl. XIV.). Judging from a specimen of a young bird in my collection from South Tunisia, the species must commence nesting operations early in the year, probably the end of February or beginning of March, but the breeding season is no doubt continued throughout March and April, and perhaps into May. The nest, which seems always to be placed in a depression in the ground, hidden by a tussock of Halfa-grass or some other desert plant, and surrounded by small stones, is large and well-built, being composed of grasses and plant stems, with a lining of a finer material. The eggs, the complement of which is apparently three, are coloured with a delicate apricot tinge, covered all over with rust-red and rose-violet markings. Measurements about 24 × 18 mm.

"The shell of the eggs is very fine and transparent, and has a dull gloss."

Although Russ gives an account of the species, he seems not to have been aware that it had been imported. Probably when his first volume appeared it had not been, since it was ten years later—in 1889—that five examples were purchased by the London Zoological Society and exhibited in their Gardens at Regent's Park.

Algerian Shore-Lark (*Otocorys bilopha*).

Upper surface generally sandy buffish, slightly vinaceous, somewhat more rufescent on upper wing-coverts and secondaries; inner webs of primaries blackish-brown, outer webs, excepting that of the outermost feather, which is white, rufescent; central tail-feathers rufescent, the others black, the outermost pair with white outer webs; forehead and a broad eyebrow-stripe white; lateral recurved frontal ear-like tufts black; crown just behind the tufts white; lores and front of ear-coverts black; back of ear-coverts, chin, upper throat, and sides of neck white; a broad black crescentic gorget on lower throat; rest of under surface white, washed with sandy buff on sides and flanks; bill bluish

with black tip; feet purplish-brown; irides dark hazel. Female smaller, the dark parts less black, browner; ear-tufts and gorget smaller.

J. I. S. Whitaker ("Birds of Tunisia," Vol. I., pp. 293-294) says: "*O. bilopha*, like other Horned Larks, is exclusively a ground bird, and is usually to be found frequenting stony plains, in preference to the sandy desert or the salt marsh-country of the Sebkas. Elevated rocky plateaux are favourite haunts of the bird, and of these there is no lack in Southern Tunisia. The vegetation of these districts is naturally of a desert or semi-desert description, and is limited to stunted, dwarf shrubs and low-growing plants, which, however, appear to afford shelter to the birds and convenient sites for their nests. According to Dr. Koenig, one of the commonest of these plants is *Helianthemum hirtum*, Pers, and where that shrub grows one may be almost sure of meeting with *O. bilopha*. Halfa-grass and other graminaceous plants also flourish in some of these districts. In such localities the Desert Horned Lark is to be met with chiefly in pairs during the early spring and in flocks during the remainder of the year, when it is apparently more shy, and not so easily approached as it is in the spring. During the breeding season the species is certainly anything but shy, and allows one to approach close to it.

"In Tripoli Mr. Dodson found the species in small family parties in the late spring, and in flocks, often of considerable size, during the summer, when occasionally he noticed the Horned Larks consorting with the small Desert Lark, *Ammomanes C. versicolor*. He observed a peculiar habit the present species has of flying in curves when ascending, uttering a short, sharp note while doing so, and then a more prolonged note when descending. The male bird has a rather bright and pleasant though disconnected song. The food of the species consists of small seeds and insects.

"To Dr. Koenig, who was fortunate enough to meet with several nests and eggs of this Lark in the Algerian Sahara, we are indebted for some interesting notes concerning its breeding habits. The nests he found were generally placed at the foot of a desert shrub, often *Helianthemum hirtum*, and were carefully constructed of plant-stems and grasses, lined with a little wool and pieces of linen stuff, the whole being surrounded by small stones. The eggs, of which two appear to be the usual complement, although three are sometimes found, vary considerably in tint, the ground-colour being at times cream colour, at others a pinkish-white, and occasionally bluish or greenish-white; the shell-spots are violet, and the surface-spots brick-brown. Sometimes the entire surface of the egg has a clouded or marbled appearance. The average measurements appear to be 21×15 mm."

Five examples of this Lark were purchased by the Zoological Society of London in January, 1889.

White-bellied Shore Lark (*Otocorys chrysolæma*).

A race of the common Shore Lark, but considerably smaller, and with the throat rich or pale yellow; general colour more ruddy and less vinous. Female smaller than male, and, of course, with shorter wing. Hab., "Tablelands of Mexico, extending north to southern New Mexico and Arizona, and westward across Southern California to the coast."—(Ridgway, "Manual," p. 349.)

J. G. Cooper, who recognises only one so-called Horned Lark in California, says ("Ornithology of California," Vol. I., p. 253):—"In May or June the males rise nearly perpendicularly into the air until almost out of sight, and fly about in an irregular circle, singing a sweet and varied song for several minutes, when they descend again, nearly to the spot they started from.

"The nest is made in a small depression of the ground, usually under a tuft of grass or a bush, composed of grass, sometimes lined with hairs, and the eggs are bluish-white with darker spots nearly covering them; their number four or five.

"In the fall they associate sometimes is very large flocks, frequenting the bare plains or prairies, but not the sea-shore. Both the name of Skylark (belonging properly to another species) and Shore Lark are objectionable, and Horned Lark, though not strictly correct, is the most appropriate, and as applicable as Horned Owl

"Their food consists of the small seeds and insects they find among the grass. They probably never alight on a tree or bush."

On the other hand, Major Bendire tells us ("Life Histories," Vol. II., p. 341): "It is also reported as breeding at San Quentin, near the coast. "It is not uncommon throughout the coast districts of Southern California." On p. 342 he says:—"Nidification usually begins about the middle of April, and probably two broods are regularly raised in a season, as fresh eggs are frequently found in June. From two to four are laid in a set, generally three. These resemble those of the previously described sub-species in coloration and shape.

"The average measurements of twenty eggs in the United States National Museum collection is 20.69×15.37 mm., or about 0.82×0.60 inch."

Calandra Lark (*Melanocorypha calandra*).

The general colouring of the upper parts is brown, somewhat buffish on the mantle and greyish on the rump; the upper tail coverts with a tawny hue, the feathers of the crown, neck, mantle, and upper back with blackish centres; lesser wing-coverts greyish-brown; remainder of wing-feathers dark brown with slightly tawny borders; the flights, excepting the innermost secondaries with white tips, the second primary with white border to the outer web; tail feathers dark brown with ruddy brown borders, all excepting the two central ones with tips increasingly white, the last but one on each side having the outer web white and the last feather almost entirely so; lores and superciliary streak pale buff; sides of face spotted with blackish, ear-coverts brown with buffish shaft-streaks; cheeks pale; a creamy patch on the neck behind the ear-coverts; under parts, white; a black triangular patch on each side of the throat; neck spotted with triangular markings; a large brown patch tinted with tawny and spotted with blackish on each side of the breast; flanks, ruddy greyish-brown; bill, horn-brown; feet, brown; iris, hazel.

The female is slightly smaller than the male, and has the first long primaries shorter than in that sex; it is also slightly more ruddy in tint, is more spotted with black on the breast, and has smaller black patches on the throat. Hab., Southern and Central Europe and the Mediterranean, through Persia to Central Asia and the Altai district, southwards to Northern Afghanistan.

Although this species has been included in various works on British birds, there is no certainty that it has ever visited our islands; it is, moreover, such a favourite cage-bird in the South of Europe, whence it is imported into this country by the foreign bird-dealers, usually in very rough condition, that I feel bound to include it in this series of foreign cage-birds.

In its wild state the Calandra Lark is very similar in habits to our Skylark, frequenting open and cul-

tivated districts, and building its nest after the manner of our bird in a depression on the earth amongst herbage; it lays four or five eggs, not unlike those of the Skylark, but larger; it is a pleasing songster, and sings chiefly when soaring; after the breeding season it is gregarious. In the summer it lives upon insects and seeds, and in the winter on seeds alone. In captivity it should be fed exactly in the same manner as all other Larks—upon soft food, canaryseed, mealworms, and any small insects or their larvæ which may be obtainable; a little watercress or chickweed will also prove beneficial in the summer time.

Tien-tsin or Mongolian Lark

(*Melanocorypha mongolica*).

The prevailing colour above is brown, the feathers of the back and rump with central blackish streaks; the primary coverts are brown with pale margins, as are also the primaries; the upper tail-coverts are ferruginous-brown towards their edges, which are margined with white; the tail-feathers are dark brown, with very broad ferruginous margins on the centre feathers, the remainder are edged with white along both webs, most widely on the outer feathers, the outermost being entirely white; on the sides of the neck in front is a large patch of black, which meets across the throat,

The Tien-tsin Lark.

forming a distinct collar with narrow centre; the back of the neck rufous or chestnut; the crown of the head of the same colour, but with a pale central patch, a broad white eyebrow produced backwards to join a creamy buff band round the nape; under parts white, the sides of the throat, cheeks, sides of breast and thighs tinged with tawny, the lateral breast-feathers having also dusky centres; bill clear flesh-coloured; legs reddish-brown, the toes yellowish with brown claws; iris of eye ashy-brown. Hab. Eastern Siberia to Northern China and Kokonoor. The flight of this Lark is undulating and very rapid; like our English bird, it rises towards the sky in song, but it does not soar so high; it also sings when flying near the ground or from the top of a stone. It is mentioned as a remarkable fact that the Tien-tsin Lark sometimes perches on trees, but I had a tame nestling English Skylark which spent a great part of the day either on a branch in the aviary at a height of at least 6 ft. from the ground or upon the ledges inside the wire netting. Even in its wild state the Skylark sometimes, though rarely, perches upon a branch, and not infrequently upon a clipped hedge or fence; therefore, the behaviour of the Mongolian Lark is not very strange after all. The Tien-tsin Lark begins to lay early in June, so that it is a late nester; the eggs are of a dirty yellow-white colour, with grey or pale brown lines and spots. The natural song of the bird is described as not at all copious, but its power of mocking other birds, especially when kept in a cage, has been remarked.

Mr. Abrahams kindly gave me a fine example about 1891, which had picked up so many notes through long companionship with other birds and beasts that its song was very entertaining. It commenced with the *tweet* of a Canary, admirably reproduced, then two harsh notes and a shrill chirp, three harsh notes and a chirp, four and a chirp, then about nine or ten shrill chirps all alike, followed by a run, in true Lark language, two whistled notes and a chirp, about five double notes, almost like the *chisick* of a Wagtail; then a long whistled note, another series of double notes and three or four long notes; three or four Lark trills, shortening with repetition; four long notes, three chirps; three long notes, three chirps; a staccato scale or two, terminating plaintively; then five or six harsh notes, and, lastly, an exact imitation of the miaw of a cat, repeated from three to eight times; or more if answered by a similar miaw.*

The Chinese cages are provided with a central wooden pedestal, from which the song is usually delivered, though at times a food tin is used for the purpose. They are circular in shape, and cannot easily be cleaned, and as that in which my bird was given to me did not satisfy me, I had one made on my own plan, 2 ft. in length, wooden at back and ends, and with a good height (about three inches), wooden in front, bars of curved willow, arched over the remainder of front and top, the food and water pans sliding in troughs from front along each end of cage; a fixed mushroom-like table in the centre for the bird to sing from, no draw-tray, but a movable slip to admit scraper, sand sifted in at the top. This answered admirably.

This bird is considerably larger than our English Lark, its total length being 8 1-5th in.

Black Lark (*Melanocorypha yeltoniensis*).

Entirely black; some of the feathers with traces of sandy-buff fringes, probably the remains of the winter fringes, which are, broadly, sandy. Female sandy-brown, with dark centres to the feathers; flights blackish with whity-brown edges, whiter on the primaries; crown mottled with black; under surface white, throat washed with sandy-buffish; fore neck, breast, and sides spotted or streaked with black; flanks more distinctly streaked; wing distinctly shorter than in the male. Hab., "Central Asia, ranging into Southern Russia, and sometimes even further westward." (Sharpe.)

Although a flock of this species appeared on the south-east coast of England towards the end of January, 1907, it is a significant fact that about that time many from the Continent were on sale in Leadenhall Market. Larks, Quails, and Ortolans are generally imported in runners containing perhaps from fifty to sixty, or even more, specimens. I have seen them crowded together like bullocks in a cattle-truck, with barely room to pick up the seed scattered on the floor of the cage. An accident to one of these cages during the transit of a consignment from the Continent would release quite a respectable flock, which would be pretty certain to make for the nearest land. For this reason I do not consider that the claim of the Black Lark to

* The song was carefully noted whilst the bird was singing.

be regarded as a British bird has been satisfactorily established.

All that I have been able to discover respecting the wild life of this Lark is that it wanders about in large flocks, and feeds upon seeds and insects; it is said to be excellent as an article of food, but my library of works on European birds is very incomplete. According to the "Royal Natural History" the bird lays four bluish eggs spotted with yellow.

In "The Avicultural Magazine," First Series, Vol. V., pp. 169-176, Mr. Reginald Phillipps gives an interesting account of the breeding of the Black Lark in 1898 in his aviary. The hen made a hollow in the ground under the stem of a Virginian creeper, and lined it with short, soiled hay. She laid six eggs of a pale grey-white colour, blotched all over with pale or grey-brown, the spots, as usual, more confluent at the larger end; some eggs with darker and more decidedly brown spots than others; four young were hatched, but the mother built again about the time when they left the first nest, and neglected them, so that eventually only one was reared. I would recommend anyone especially interested in this group of birds to get Mr. Phillipps' article, and read it through carefully; it is the more interesting because Dr. Russ says that not much has been published respecting the behaviour of the species in captivity. "In the Berlin Aquarium all the specimens soon died, but on the other hand a beautiful pair exists in the Zoological Gardens, and has given proof that it is long-lived in captivity. I have not been able to discover a song, but Meusel, the keeper, told me that it was loud and ringing, similar to that of the Crested Lark, but sounded still more pleasing."

The London Zoological Gardens acquired four examples in 1876, and two in 1883; possibly they may have had others.

Indian Skylark (*Alauda gulgula*).

Very like the greyish form of the European Skylark, but much smaller, the under wing-coverts paler and the flank stripes almost entirely wanting; bill with upper mandible brown, lower mandible fleshy-yellow; feet fleshy-yellow; irides brown. Female smaller, with shorter wing; upper mandible brownish, lower mandible fleshy; feet fleshy-yellow, with dusky claws; irides dark brown. Hab., India, Ceylon, Burma, South China, Formosa, Hainan, and the Philippines.

Dr. Sharpe includes the Sweet-voiced Lark (*A. cælivox*) as inseparable from *A. gulgula*, of which he says, "it is only a pale race."

Jerdon observes ("Birds of India," Vol. II., p. 435) that "The Indian Skylark is found throughout the whole of India, frequenting grassy hills, meadows, and fields; the grassy edges of tanks are favourite spots, and also the bunds of rice fields, in which they (sic) often breed. It rises into the air singing, but does not perhaps soar so high as the Laverock of England. It breeds from March to June, making its nest of grass and hair, on the ground under a tuft of grass; and laying three or four greenish-grey eggs, with numerous brown and dusky streaks and spots. In the cold weather they associate more or less in flocks, and are taken in great numbers for the table." "The song," says Mr. Blyth, "very closely resembles that of the British Skylark."

An example of this species was acquired by the London Zoological Society in 1872, and in 1892 the Chinese race *A. gulgula var. cælivox* was added to the collection at the Gardens. The species appears, however, not to have been received in the German bird-market.

Short-toed Lark (*Calandrella brachydactyla*).

So many examples of this species have strayed to our shores that it is now generally recognised as a British bird, and consequently I would simply refer any of my readers who may acquire it to any of the excellent works on the birds of our islands which have appeared of late years.

Bar-tailed Lark (*Mirafra apiata*).

Above deep brown, indistinctly barred with rufous and black; wing-coverts similar, but tipped with rufous; flights mostly brown, with rufous edges, but the inner secondaries with black shafts and bars; tail brown, outer feather with fawn-coloured edges; eyebrow-stripe pale fawn; ear-coverts rufous; under surface bright fawn, the throat and chest speckled with black; bill horn-colour; feet pink; irides hazel. Female similar, but smaller. Hab., Cape Colony.

In Stark and Sclater's "Birds of South Africa," Vol. I., p. 218, we read: "Like all the *Mirafræ*, this species frequents not only the open country, but also ground studded with clumps of bushes, on which it readily perches if disturbed; sometimes, however, it runs along the ground for a long distance in front of an intruder, crouching at intervals until closely approached, then running on as before. Like other Larks, it feeds on small seeds and insects."

Layard writes that this species "is well known from its singular habit of rising 15ft. or 30ft. into the air, perpendicularly, making a sharp, cracking sound with its wings as it rises, uttering a long shrill 'phew,' and then falling as abruptly to the earth. This action it will repeat at intervals of a minute or two, for an hour or more, chiefly during dull mornings, but in bright weather it commences before and after sunset. It delights in warm sandy soils, but we meet with it on the high tableland of the Cold Bokkeveld in considerable abundance."

Shelley says ("Birds of Africa," Vol. III., p. 42): "The egg, according to Mr. A. Nehrkorn, is greyish-yellow with spots of violet or rufous-brown evenly distributed over the surface, and measures 0.88in. × 0.6in."

Russ says: "Some years ago I saw five head in the Zoological Gardens of Hamburg, which the director at that time, Dr. Hilgendorf, said had been imported by Miss Hagenbeck."

Madras Bush-Lark (*Mirafra affinis*).

Above dark brown, with pale rufescent margins to the feathers; lower back and rump more uniformly brown; primaries and their coverts dark brown with rufescent edges, this colour not extending to the base of the quills; secondaries dark brown, rufescent on outer webs, the inner webs rufescent at base; tail with the four central feathers pale brown, the remainder much darker, the two outermost with yellowish-white on outer webs; a buff-whitish eyebrow-stripe; ear-coverts pale rufous with dusky tips; under-surface white, slightly washed with buffish; breast marked with large oval brown spots; bill with the upper mandible dark brown with fleshy edge, lower mandible fleshy with dusky tip; feet fleshy, brownish on edge of scales; eyelid brownish-fleshy; irides reddish to yellowish brown. Female similar, but smaller, and with shorter wing. Hab., Ceylon and South India up to Maunbhoom.

Jerdon says ("Birds of India," Vol. II., p. 418): "It is a tolerably familiar bird, entering gardens, and coming close to houses, and does not care so much as some others of the genus to conceal itself from observation,

for it simply squats, in general, close to the ground, and does not hide itself. It frequently perches on shrubs, or even on trees, and takes short flights in the air, descending again with outspread wings. It breeds on the ground, making a loose nest of grass under the shelter of a bush or tuft of grass, and lays three or four eggs, greenish-grey, with spots and stains of brown, and dusky. It has a pleasant little song, which it utters during its short flights, or occasionally from the ground."

Colonel Legge ("Birds of Ceylon," Vol. II., pp. 635, 636) gives the following account of its habits:—"This Lark loves grassy wastes studded with trees and bushes, openly-timbered plains, scrubby enclosures, and dry pasture-land surrounded by trees. It is also found in open spots in the heart of the jungle, and round the borders of tanks and salt-water estuaries and lagoons. It is to some extent arboreal, especially in the breeding season, when the male constantly mounts to the topmost branch of some dead or scraggy tree, and pours out his little love-song, launching himself out into the air, and descending rapidly, with increasing fervour of note, to the vicinity of the nest, where his partner is patiently performing the duties of incubation. It is not gregarious, but usually lives in pairs, several of which, however, occupy contentedly the same locality, passing their time in catching insects, and feeding likewise on grass-seeds, varying the monotony of the noonday heat by now and then flying up into the air or alighting on trees and bushes, from which they give out their long-drawn sibilant whistle—Tseee-tseee-tseee. These Larks do not mount to any height, nor do they remain any time in the air. Their actions are Pipit-like, for after reaching the altitude to which they wish to ascend they quickly sail down again with upturned wings, continuing the note they commenced with on leaving the ground until they re-alight, when it is suddenly hushed. They often descend to a low tree or bush, and sometimes continue their notes for a few seconds. Mr. Ball remarks that it is a very early bird, sometimes singing before dawn.

"*Nidification.*—In the Western Province the Bush-Lark breeds in May and June, and in the north somewhat earlier, commencing about March. It nests in a little depression in the ground, generally beneath the shelter of a tuft of grass or tussock of rushes. It sometimes, however, in sandy soil excavates a hollow itself, and therein it constructs its nest. It is a loosely-made cup of dry grass and fine roots of herbs, measuring about 3in. wide by 2in. in depth; the top is flush with the surface of the soil, and over the nest the adjacent blades of grass are bent or arranged so as to conceal it. The eggs are nearly always two in number, stumpy ovals in shape, and of a greenish-white ground-colour, boldly marked almost equally throughout with light umber-brown and blackish-brown spots, the latter being small in some and large in other eggs.

"The young become fledged very rapidly, flying in about a fortnight from the time they are hatched. The old birds are very zealous in their attempts to draw off intruders from their young, running along the ground with trailing wings, or feigning lameness or incapacity to fly."

This bird reached the London Zoological Gardens in June, 1872.

Crested Lark (*Galerita cristata*).

This widely-distributed Lark has appeared on our coasts often enough to be generally regarded as British, and therefore I refer my readers to works on the birds of our islands in case they require information respecting it.

Thick-billed Lark (*Calendula crassirostris*).

Above dark brown, the feathers bordered with sandy buff; lower back and rump more uniform, greyish-brown, the lower back with a few mesial dark brown streaks; wing-coverts dark brown washed with greyish, the lesser and median coverts bordered, and the greater coverts more narrowly edged, with sandy buff, the latter also with ashy edges; flights brown, the outer web narrowly edged and tipped with buffish-white; secondaries washed with grey; upper tail-coverts greyish brown washed with buffish and with dark brown central streaks on the longest feathers; tail-feathers dark brown edged with grey, the two outermost feathers edged and tipped with buffish-white or buff; head paler brown than the back and with narrower dark streaks, the hind neck more fulvous and minutely streaked; a streak along margin of crown, the lores and orbital feathers buffish white; cheeks of the same colour, but dotted with black-brown; ear-coverts dark brown streaked with buff; under surface dull yellowish-white, the throat slightly spotted and the lower breast and sides narrowly streaked with black-brown; flanks greyish brown with dark brown streaks; under wing-coverts pale greyish brown edged with buffish white, the outer feathers with brown spots; upper mandible horn-colour, lower buff shading into horn-colour towards the tip; feet pale brown; irides brown. Female similar, but smaller and with rather shorter wing. Hab., South Africa.

Stark observes ("Birds of South Africa," Vol. I., pp. 202, 203):—"The Thick-billed Lark is usually to be met with on level or gently undulating ground and on sandy soil with a scanty growth of bushes, occasionally it may be seen on ploughed land. In Damara Land, according to Andersson, 'it frequents localities covered with grass and dwarf vegetation, and frequently those of a rocky character.'

"This Lark is nearly always in pairs; it has a prolonged drawling call-note, and in spring a short song, often uttered by the male as he rises for a short distance on the wing; it feeds on seeds and insects, especially on small beetles.

"About the middle of September, in Cape Colony, the female constructs her nest, of dry grass and horse-hair, in a slight hollow scratched at the side of a grass-tuft. Four or five eggs are laid towards the end of the month. They are pale cream-colour, more or less spotted and mottled with various shades of purplish-brown and grey. They measure 0.90×0.65."

An example of this species was presented to the London Zoological Society in April, 1867, and was exhibited at the Gardens in Regent's Park; it is probable that other specimens have since been imported.

Lichtenstein's Desert-Lark. (*Ammomanes deserti*).

Above sandy buff washed with vinaceous; upper tail-coverts more inclined to cinnamon; wings pale brown; the coverts edged with rufescent buff, as also the outer margins of the secondaries and of all excepting the two outer primaries; tail brown, the outer edges of the feathers and the outer webs of the two outermost pairs rufescent buff; ear-coverts like the upper surface; rest of sides of head and upper neck and the throat white; rest of under surface of body sandy buff, paler on abdomen; a few indistinct brown spots on the lower throat; under wing-coverts and part of

inner margins of quills rufescent buff; bill and feet dull flesh-colour. Female similar, but slightly smaller. Hab., Palestine to Egypt, Nubia and Abyssinia.

According to Von Heuglin this species is generally to be met with in pairs along the borders of the cultivated land and the desert, often frequenting the caravan tracks and feeding on insects, corn, and the seeds of desert plants. The note is very insignificant, and the birds keep to the ground, only occasionally perching on bushes.

According to Shelley ("Birds of Africa," Vol. III., p. 98 :—" They construct a neatly-formed nest of grass, placed in a slight depression and sheltered by a tuft of grass or a large stone, and lay four eggs. These are of an ashy cream colour, obscurely marked with purplish grey and more distinctly so with brown. They measure 0.9 in. × 0.6."

Russ says that this bird arrives in the trade occasionally in single specimens.

White-headed Bullfinch-Lark (*Pyrrhulauda verticalis*).

Above ashy-grey mottled with brown; wing-coverts brown with grey edges; flights dark brown with grey edges; central tail-feathers pale brown with white edges, the remainder dark brown with grey edges, excepting the outermost, which is white with a brown patch at base of inner web; crown black; centre of occiput, ear-coverts and nape white, behind which is a black collar encircling the neck; lores, front of cheeks, throat and body below blackish-brown; bill horn-coloured; feet dark flesh-coloured; irides dark brown. Female with the eyebrow and lores buffish; throat and under surface of body white tinged with rufous. Hab., South Africa, ranging to the Transvaal on the east and the Congo on the west.

Dr. Stark says ("Birds of South Africa," Vol. I., p. 196) :—"In Northern Cape Colony these small Larks congregate in considerable flocks during autumn and winter, and usually keep to the open veldt, where they run about on the ground in search of fallen grass-seeds and small insects. If disturbed they fly for a short distance, with undulating flight, and alight again directly on the ground at no great distance. While running about they frequently utter a shrill, but not very loud, chirp. About the middle of August the flocks break up and the birds separate in pairs, and about a month later commence to build their nests. Some slight hollow is chosen by the side of a tuft of grass; this is lined with fine dry grass, to which a few horse-hairs are occasionally added, and in this slight nest two or three eggs are laid. These are of a pale cream-colour or dull white, somewhat thickly spotted all over with two shades of pale amber brown. They average 0.80 × 0.65."

The London Zoological Society secured three examples of this species in September, 1873. Oddly enough Russ does not note the species, although he describes many species which have never been imported.

White-cheeked Bullfinch-Lark (*Pyrrhulauda leucotis*).

Upper back and scapulars cinnamon, some of the feathers partly edged with buff; lower back and upper tail-coverts buff, centres of feathers slightly ashy; median and greater wing-coverts cinnamon with broad buff edges; flights dusky brown edged with rufous, most broadly on the inner secondaries; tail-feathers blackish-brown, the central ones with pale rufous inner edges, the outer ones becoming dusky white on outer webs and towards the tips; head and neck black; ear-coverts and a band crossing hind neck white; throat and under surface of body black; a patch of white and chestnut at sides of lower throat; flanks and thighs whitish; under wing-coverts black; flights dusky brown below, with inner edges partly pale rufescent buff; bill ashy white; feet ashy; irides hazel. Female with no black on head; ear-coverts streaked with buff; under surface buff, thickly mottled with black down throat and centre of breast; axillaries and most of under wing-coverts black. Hab., South Africa north to Damaraland on the west and over the eastern half of Tropical Africa.—(Shelley).

Dr. Sharpe regarded the southern examples as representing a distinct sub-species (*P. smithii*), but Captain Shelley merely records it as a synonym of *P. leucotis;* on the other hand, Messrs. Stark and Sclater follow Dr. Sharpe.

Dr. Stark says ("Birds of South Africa," Vol. I., p. 197) :—"Very like *P. verticalis* in its habits, but it is usually in smaller flocks, numbering from ten to forty or fifty individuals, and it is often found feeding on the ground among dwarf bushes, while *P. verticalis* keeps to more open country."

Captain Shelley quotes the following, among other notes on the habits ("Birds of Africa," Vol. III., pp. 88, 89, and 90) :—"Mr. Boyd Alexander . . . writes: 'It frequents flat portions of stony ground. In the breeding-season the male sings on the wing, rising vertically up from the ground, and descending to earth again with hardly a beat of the wings. The call-note, uttered on the ground, is a ventriloquial pipe.'

"Living in colonies, these birds are continually shifting from one locality to another, according to the supply of food. At Zumbo they suddenly appeared on December 13th, when the grain had just been sown. The food consists chiefly of grass-seed.

"Above Khartoum Mr. H. F. Witherby found these Larks less numerous than *P. frontalis*, with which they associated, and writes : 'On May 11 we found a nest of this species in a small scooped-out hollow in the caked mud amongst some very short burnt-up grass near the river. The nest, which was sheltered by a large lump of mud, was a shallow "cup" composed of dry grass and two or three bits of cotton. Round the "cup" was a compact and neatly arranged layer of particles of mud, perhaps made by the birds during the formation of the hollow in the caked ground. The nest contained one egg, from which the female flew on our approach.'"

Russ observes of typical *P. leucotis* that of late years it has on several occasions been imported by Miss Hagenbeck, Mr. Charles Jamrach, and certainly once by smaller Hamburg dealers. It reached the Zoological Gardens of Frankfort am Main in 1872, and those of Hamburg in 1874, and he considers it unaccountable that it should not have reached the London Gardens; in 1907, however, Mr. Seth-Smith presented an example of *P. smithii* to the London Zoological Society.

PITTAS (*Pittidæ*).

Formerly supposed to be related to the typical Thrushes, but the late Professor Garrod proved them to be allied to the New World birds placed by him in a section called *Mesomyodi*. They are birds of brilliant colouring, of robust build, with short tails and long legs, short rounded wings, and straight and tolerably powerful bills. They run quickly on the ground, but their flight is short and weak. For food they are said to prefer grasshoppers, termites, and other insects, with their larvæ and pupæ, and Gould thinks that probably

berries, fruits, and snails are also eaten. According to the Rev. Hubert D. Astley (*The Avicultural Magazine*, First Series, Vol. VIII., p. 8), they feed well upon an insectivorous mixture, mealworms and "daddy-long-legs" (*Tipulidæ*). Mr. Phillipps, however (t. c., pp. 182-183) seems to regard mealworms when frequently given as injurious to these birds, and evidently prefers small cockroaches; he says that they "would gladly partake of cut-up grapes, but this probably more as medicine than as food; and seed was occasionally picked up." The general outline of the species of *Pitta* reminds one of the Dippers, and (like those birds) it sometimes stands in the same semi-erect attitude, with the short tail pointed downwards.

Indian Pitta (*Pitta brachyura*).

Above bluish-green, rump and lesser wing-coverts pale azure blue; flights black tipped with whitish, and with a broad white band at base of primaries; tail black with dull blue tip; crown with a central black stripe from bill to back of neck, bounded on each side by a broad yellowish-brown band; a narrow sandy whitish eyebrow-stripe passing into pale bluish lateral tufts on the nape; sides of head black; chin, throat, and sides of neck white; underparts otherwise deep fawn-colour, with the middle of hinder abdomen, vent and under tail-coverts scarlet; under wing-coverts black with a white patch; wings below black with a white basal band; bill blackish, paler on culmen; feet fleshy yellow; irides hazel. Female with longer and more slender bill, with paler lower mandible and more divergent rami. Hab., India, Ceylon, and Tenasserim.

Jerdon says of this species ("Birds of India," Vol. I., p. 504):—"It is most common in forest country, but is also found occasionally in every part of the country that is tolerably wooded. In the Carnatic it chiefly occurs in the beginning of the hot weather, when the land-winds first begin to blow with violence from the west; and the birds, in many instances, appear to have been blown by the strong wind from the Eastern ghats, for, being birds of feeble flight, they are unable to contend against the strength of the wind. At this time they take refuge in huts, outhouses, or any building that will afford them shelter. The first bird of this kind that I saw had taken refuge in the General Hospital at Madras; and, subsequently, at Nellore, I obtained many alive under the same circumstances. Layard states that in Ceylon it is migratory, coming in with the Snipe—*i.e.*, in the beginning of the cold weather. He further remarks that it is shy and wary, resorting to tangled brakes and ill-kept native gardens. It seldom alights on trees. It is generally found single, but I have seen three or four together; and it feeds chiefly on the ground, on various coleopterous insects. It progresses by hopping, as do others of this family; and is in general a most silent bird, though it is said to have, at times, a fine loud whistling note. Its Singalese name is said to be derived from its call *Aritch-i-a*, pronounced slowly and distinctly. Blyth was informed that it has a screeching note."

Hume ("Nests and Eggs," Second Edition, Vol. II., pp. 285, 286) says:—"My friend Mr. F. R. Blewitt has taken a vast number of the eggs of the Indian Pitta in the neighbourhood of Raipur, Central Provinces. The nests, three of which he sent me with the eggs, were huge globular structures, fully 9 inches in horizontal diameter and 6 inches high, with a circular aperture on one side. They were composed internally of fine twigs, notably those of the tamarisk, and grass-roots; externally, of dry leaves, many of them skeleton leaves, held in their places by a few roots or twigs. The internal cavity may have been about 4 inches in diameter. The nests were placed in brushwood and scrub jungle, either on the ground or on low branches close to the ground. The nests were taken in July and August. They also breed, I know (though I could never find the nests), in the Doon and the northern parts of Rohilcund. Mr. R. Thompson remarks:—'As this bird comes in regularly about the first week in May, and remains in the Bhabur till July or August, uttering its sweet call of two simple notes, I am led to think it breeds with us. What becomes of the bird at other seasons I do not know.'"

"Few Indian eggs are more beautiful than those of this species. In shape they are excessively broad and regular ovals; some, indeed, are almost spherical. They are excessively glossy, more so than almost any other egg I know. The ground-colour is china-white, sometimes faintly tinged with pink, sometimes creamy; and the eggs are speckled and spotted with, and in some cases also painted with, fine hair-like lines of deep maroon, dark purple, and sometimes brownish-purple, as primary markings, and pale inky purple as secondary ones. The primary markings are scattered, in some instances pretty thickly, in others very sparingly, over the whole surface of the egg, but are always much denser towards one end, to which in some eggs they are entirely confined, and here alone the secondary markings are at all conspicuous. Here they often form a sort of nimbus round all the spots, blotches, and lines, all the interstices between which they occupy, and unite to form an irregular mottled cap. There is something about the character of the egg which indicates to me that the Pittas should be placed nearer the Bulbuls and the Orioles than the true Thrushes. I should note that there is one not uncommon type in which the whole egg is devoid of markings, except within a broad zone near one end, and even here they only consist of widely-scattered and minute specks of maroon and pale lilac.

"The eggs vary from 0.96 to 1.07 inch in length, and from 0.81 to 0.9 inch in breadth; but the average of fifty eggs is 1.01 by 0.86 inch nearly."

The London Zoological Gardens have exhibited this species twice—in 1876 and 1882. In 1901 the Rev. H. D. Astley was fortunate enough to secure four hand-reared examples, which later on came into the possession of Mr. Reginald Phillipps; this gentleman has published a very full account, illustrated by a coloured drawing prepared by Mr. Astley, in *The Avicultural Magazine*, First Series, Vol. VIII., pp. 179-185 and 257-262, a study of which will repay anyone who desires further information respecting this beautiful bird.

Noisy Pitta (*Pitta strepitans*).

Dark green above; wing black, with a white patch; lesser coverts pale glossy blue, edges of greater coverts and secondaries green; a pale blue band across rump; crown chestnut-brown with a vertical black streak; nape, back of neck, and sides of head, as well as throat and centre of fore-neck black; below pale fawn with a black central abdominal patch; lower abdomen and under tail-coverts scarlet; tail black with greenish tip; under wing-coverts black. Female not differentiated, but apparently with a slighter and shorter bill, and with the scarlet on body below duller and more diffused. Hab., Eastern Australia, Islands of Torres Straits, and Southern New Guinea.

Gould observes ("Handbook," Vol. I., p. 431): "It is said to be very Thrush-like in its habits and disposition, and, as its long legs would lead us to suppose, to resort much to the ground, but to take readily to the

branches of trees when its haunts are intruded upon. Its food consists of insects, and probably berries, fruits, and snails."

"I have received its eggs, accompanied by the following notes, from the late F. Strange, of Sydney:—

"'I never saw any bird whose actions are more graceful than those of *Pitta strepitans* when seen in its native brushes, where its presence is indicated by its singular call, resembling the words "*want a watch*," by imitating which you can call it close to the muzzle of your gun; no sooner, however, does it commence breeding than it becomes shy and retiring, keeping out of sight in the most artful manner, moving about from place to place, and occasionally uttering its cry until it has drawn you away from the nest. The nests I have seen were generally placed in the spur of a fig-tree, sometimes near the ground, and were outwardly constructed of sticks, and lined with moss, leaves, and fine pieces of bark. The eggs are four in number,' of a pale creamy-white, marked all over with irregularly-shaped blotches of brown and deep vinous grey, the latter appearing as if beneath the surface of the shell; they are one inch and a quarter in length by seven-eighths of an inch in breadth."

Two examples of this species were purchased by the London Zoological Society, and exhibited at Regent's Park in March, 1894.

Green-breasted or Hooded Pitta (*Pitta cucullata*).

Above very like the preceding species; the primaries crossed by a broad white subterminal band; below bright green, the throat and a central abdominal patch black; lower abdomen and under tail-coverts scarlet; under wing-coverts black; bill black; "feet brown" (Sharpe), pale reddish (Jerdon); irides brown. Female not differentiated. Hab., Nepal and through Assam and the Malay Peninsula to the Island of Banka.

Jerdon says ("Birds of India," Vol. I., p. 505):—"I only procured one specimen, which was killed by a Lepcha, when seated on her nest, on the banks of the great Rungeet River, about 1,200 feet above the sea. The nest was composed chiefly of roots and other fibrous matter, with a few hairs, and contained three eggs of a faint greenish-white, with a few reddish and some fawn-coloured spots."

Russ describes this, as he does *P. iris;* but apparently only because he thinks they may be imported; it would seem never to have reached the London Gardens; but, in *The Avicultural Magazine*, First Series, Vol. VIII., p. 9, Mr. Astley speaks of a pair of what he believed to be this species which he had noticed at a Crystal Palace show a few years previously. Of course, this is quite likely, and therefore I include it here.

We next have to consider the Tyrants, a group including birds of the most varied form and colouring, and differing not a little in their habits. Regarding them from the avicultural standpoint, one would suppose the family to greatly need breaking up. It is, indeed, difficult to understand how birds so utterly dissimilar can belong to the same family.

TYRANTS (*Tyrannidæ*).

Only one species of this large family is freely imported, and, unlike a great many of the *Tyrants*, which bear a curious resemblance to Thrushes and other Passerine groups, this species is, both in appearance and habits, much more like a Kingfisher.

Upwards of 400 species of Tyrant-birds are known to science, the majority being small and inconspicuous birds, though some (as, for instance, the marvellous crested birds of the genus *Muscivora*) have no little pretension to beauty. They are all characterised by a hooked, incurved bill, combined with nearly free toes to the feet. The family is strictly confined to the New World.

Some of the Tyrants bear a certain likeness to the Shrikes, others to the Flycatchers, others again to the Wheatears, while one genus recalls the Wagtails, another the Tits, and a third some of the Warblers; yet to none of these are they really related. The term "Tyrant" was first applied to the King-bird, which differs greatly in appearance from most of the other *Tyrannidæ*.

All the Tyrants should be fed upon a good insectivorous mixture and on living insects, but some of them require a more varied diet, as I shall point out when dealing with them separately.

Pepoaza Tyrant (*Tænioptera nengeta*).

Above ash-grey; wings black, with a well-defined patch at base of primaries and the margins of the outer secondaries white; basal third of tail white, otherwise it is black with whitish-ash tip; lores white; below pale ashy, a blackish stripe on each side of the throat; middle of throat and belly, flanks, vent, and under tail-coverts white; bill horn-colour; feet black. Female not differentiated. Hab., S.E. Brazil, Paraguay, Uruguay, Argentina, and Bolivia.

Hudson observes ("Argentine Ornithology," Vol. I., pp. 114, 115): "The bird perches itself on an elevation—the summit of a stalk, or bush, or even of a low tree—to watch like a Flycatcher for its insect prey; only, instead of looking about for passing insects, it gazes intently down at the ground, just as a Kingfisher does at the water, and when it spies a beetle or grasshopper, darts down upon it, not, however, to snatch it up with the bill as other Tyrants do, but it first grasps it with its feet, then proceeds to despatch it, swaying about and opening its wings to keep its own balance, just as an Owl is seen to do when it grasps a mouse or other small animal in its claws. After devouring the insect on the spot, it flies back to its perch to resume the watch. They are very restless, active, playful birds, and seldom remain long on one spot, apparently finding it irksome to do so; but I have seen the *T. irupero* occupy the same perch for hours every day while looking out for insects."

"The Pepoazá is a swift, active, graceful bird, with a strong, straight beak, hooked at the point, and a broad tail 4 in. long, the total length of the bird being 9 in."

Mr. Barrows gives the following account of its lively habits in Entrerios: "They are commonly seen perched on fences or the tops of bushes or trees in open ground, frequently making sallies for winged insects, or dropping to the ground to catch a grasshopper or worm. When shot at while perched and watching you, they almost invariably leave the perch at the flash, pitching forward and downward, and usually evading the shot, even at short range. Several times I have secured them by shooting about 1 ft. below and 2 ft. in front of them as they sat, but they do not always fly in this direction. The rapidity of their flight when frightened, or when quarrelling, is simply astonishing. I have seen one chase another for three or four minutes, doubling, turning, twisting, and shooting, now brushing the grass, and now rising to a height of at least 200 or 300 ft., and all the movements so rapid that the eye could scarcely follow them; and at the end of it each would

go back to the top of his own chosen weed-stalk, apparently without a feather ruffled."

"Azara found this species breeding in a hole in a bank; and Mr. Dalgleish has described a nest, taken from a tree in Uruguay, as a somewhat slight structure, 4 in. in diameter, formed of sticks and fibres, lined with fine grass and a few feathers. It contained three eggs, pear-shaped, white, with large well-defined spots of reddish-brown."

An example of this species was captured at sea off the River Plate, and presented to the London Zoological Society in November, 1894, by Mr. C. V. Reed. Russ makes no mention of the bird in his work published five years later.

Short-winged Tyrant (*Machetornis rixosa*).

Above brownish-olivaceous; wings brown; tail brown, with terminal yellowish band; crown with the centre scarlet and crested; below bright yellow, paler on throat; bill and feet black. Female similar, but somewhat duller. Hab., Pampas of S.E. Brazil, Bolivia, Paraguay, Uruguay, La Plata, and Venezuela. (Sclater.)

Hudson observes ("Argentine Ornithology," Vol. I., pp. 132, 133): "It resembles the true Tyrants in disposition, in its shrill piercing language, and in the habit of perching and breeding in trees. On the other hand, like the long-legged *Myiotheretes*, that lives on the open plains, it feeds exclusively on the ground, over which it runs with a speed possessed by few perching species. The general impression one forms is that in manners and appearance the Short-winged Tyrant is quite unlike any other species, though all its habits are to be found in one or other of the various groups comprising the *Tyrannidæ*.

"These birds have no migration, but pair for life, and always remain on the same spot, and will continue to breed in the same hole for many years, even where they are frequently deprived of their eggs. Azara saw them sometimes uniting in small flocks in Paraguay; in Buenos Ayres they are always seen in pairs, or, after the young have left the nest, in families. They prefer to live near a human habitation, where there are trees; even one tree, in which they can breed and find shelter at night, will be sufficient to attach them to a dwelling, so great is their partiality for the clean-trodden ground where they can freely run about and catch insects. They haunt the cattle-pens, and become extremely familiar with the cows, horses, and sheep, following them to the pasture-grounds, where they are often seen perched on the back of a horse or other domestic animal, or stationed close to its nose on the ground, watching for insects. On the bare ground they run about with wonderful swiftness, and are able to overtake and capture flying insects without rising. The male and female invariably hunt together, and at intervals fly to some favourite perch to indulge in a duet composed of loud, rapid, shrill notes, somewhat metallic in sound. Though able to fly swiftly when in pursuit of a passing Hawk or other bird, at other times their flight is strangely slow; the round body, short blunt wings and tail giving the bird a somewhat curious appearance as it progresses laboriously through the air. I have frequently seen them make the most unprovoked assaults on birds of an inoffensive kind; possibly they are in these attacks moved by a playful rather than by a vindictive spirit. I once saw one drop like a stone from a height of fifty yards on to a pigeon perched on a leafless tree. The pigeon fell as if shot to the earth; the Tyrant-bird then released his hold; the pigeon rushed away terrified through the trees, while its persecutor rose high up in the air and resumed its journey.

"I have elsewhere spoken of the wars waged by this bird against other species, all seeking to gain possession of the large nest of *Anumbius acuticaudatus*. A hole in the trunk of a tree is also a favourite breeding-place. The nest is neatly built of slender twigs and leaves, and lined with horse-hair. The eggs are slightly oval, and densely marked with dark brown spots or stripes on a white or brownish-white ground."

Two specimens of this species were purchased by the London Zoological Society in 1892, and exhibited at Regent's Park.

Sulphury Tyrant (*Pitangus sulphuratus*).

Upper surface olivaceous ruddy brown, with the edges of the flights and outer tail feathers chestnut; head black, the forehead ashy white, a broad longitudinal patch of silky golden yellow (some of the terminal feathers of which are broadly black-tipped) on the crown, a broad superciliary waved white stripe extending back to the nape, remainder of chin, throat, and fore-chest white; remainder of under parts sulphur yellow slightly stained with ashy-olive; bill and feet black; iris chestnut. Female with the edges of flights paler; bill shorter, broader at base, more acute at tip. Hab., Guiana, the Amazons, and Brazil.

Sulphury Tyrant.

In the list of the Zoological Society of London this species is called Sulphury Tyrant, but in the "Argentine Ornithology" Sclater applied the same name to *Rhynchocyclus sulphurescens*. The present species, however, has the greater right to the name, which is adopted by Russ and by aviculturists and dealers generally; so that my proposal in "Foreign Bird-Keeping" to call it Sulphur Tyrant was mistaken; I ought to have suggested that *R. sulphurescens* should be called "Yellowish."

Burmeister says ("Systematische Uebersicht," Vol. II., pp. 461, 462):—"One of the best known birds of Brazil, and especially on account of its cry, which sounds distinctly like ben-te-vii (I see you well). The bird appears everywhere in the forest region, but always

only singly; it not merely approaches the settlements, but is fond of sitting also in the middle of a village at the top of an isolated tall tree, and makes its cry resound therefrom, with short pauses, for a considerable time. It is a bold, daring fellow, which is fond of tormenting weaker birds of prey, pursues them, calls to them, even hurls itself at them, as I have mentioned in my travels (p. 146). Its food consists of the larger insects, upon which one constantly sees it pounce; it moreover also destroys smaller birds, especially when shot, if they wish to be at peace, or young nestlings, and for that reason is pursued by other birds when it shows itself near their nests. The nest is placed in dense scrub, fairly high up, and consists of great masses of dry portions of plants, which are lined inside with feathers, hair and finer threads; it is very deep and has in addition a stiff over-arching, like a roof. The eggs, of which the number varies from 3-4, are somewhat smaller than those of the Rei-Rei, of a pale greenish colour, with scattered black and blue-green spots, which extend especially over the middle towards the blunter extremity."

Of the closely related Bienteveo Tyrant, Hudson says ("Argentine Ornithology," Vol. I., pp. 149, 150):—"Except when breeding the Bienteveo is a peaceful bird, never going out of its way to make gratuitous attacks on individuals of its own or of other species; but in the pursuit of its prey it is cunning, bold, and fierce. Like the true Tyrant-birds it preys a great deal on large insects when they are abundant in the warm season, and is frequently seen catching its prey in the air. A large beetle or grasshopper it invariably beats against a branch before devouring it. But even in summer, when insect prey is most abundant, it prefers a more substantial diet whenever such is to be had. It frequently carries off the fledglings of the smaller birds from their nests, in the face of the brave defence often made by the parents. It is also fond of fishing, and may be seen perched by the hour on a bank or overhanging branch beside a stream, watching the water like a Kingfisher, and at intervals dashing down to capture the small fry. In shallow pools, where there are tadpoles and other prey, the Bienteveo does not mind getting a little wet, but alights in the water, and stands belly-deep watching for its prey. I have seen a Bienteveo standing in the water in the midst of a flock of Glossy Ibises. They are often seen, as Darwin remarks, hovering like a Kestrel over the grass, and then dashing down to seize their prey. Small snakes, frogs, mice, and lizards all minister to its appetite, and with a capture of this kind it invariably flies to the nearest stone or branch, against which it beats the life of its victim out before devouring it. I once saw one fly out of some weeds carrying a little wriggling snake of a very brittle species and about eight inches long in its beak. Alighting on a gate it proceeded to kill its capture, and at the first blow on the wood the snake flew into two pieces. A mouse gives it a great deal of trouble, for after it has been killed it cannot be devoured until reduced by repeated blows to a soft pulp, after which it is with great labour pulled to pieces and eaten. Snails and *Ampullariæ* are also pounded until the shell breaks." Mr. Hudson also mentions that it follows the plough to pick up worms and larvæ, and that it is fond of fresh meat, and is commonly seen following a butcher's cart, and waiting for an opportunity to snatch up any small piece of meat or fat which it is able to detach.

As pointed out by Burmeister, the Sulphury Tyrant and its forms differ from the other Tyrants in building a conspicuous domed nest in a tree, that of the Bienteveo, according to Hudson, sometimes taking five or six weeks to complete. It is about a foot deep and eight or nine inches broad, and chiefly composed of wool. The entrance is near the top. The cavity is thickly lined with feathers, and contains five long pointed creamy eggs, chiefly spotted at the larger end with chocolate and purple.

On the earth this bird hops clumsily, probably on account of its rather small feet.

The so-called species *P. derbianus*, *P. bolivianus*, and *P. sulphuratus* are to all intents and purposes scarcely differing local races of one bird; therefore it is no wonder that Burmeister's "*P. sulphuratus*" was Sclater's "*P. bolivianus*." As Burmeister gives but a short account of the habits of *P. sulphuratus*, I have thought it best also to quote part of Hudson's account of the Argentine form.

I purchased a specimen of this bird, I think about the year 1895, and kept it for about a twelvemonth, when it died quite unaccountably. I found it a nervous bird, which, whenever anyone looked at it, would open its mouth to its widest capacity and let out a harsh dismal prolonged scream, exactly resembling that produced by indiarubber babies sold for a penny in the London streets. It was a great source of amusement to ask a young lady to go and examine the beauty of the bird, and note her startled jump when that awful sound greeted her. This is probably what Hudson describes in his account of the extremely closely related *P. bolivianus* as "a very long clear call-note." It is unquestionably one of the most shocking sounds uttered by any feathered biped; but Hudson speaks of the uttering of the agonised scream by both sexes, as "one pretty habit, which brings out strongly the pleasant feature in its character." All the harsh notes and scroopy songs of Argentine birds seem to have delighted this naturalist. His unstinted praise of the screechy notes of the Grey Cardinals has always astonished me.

Pitangua or Broad-billed Tyrant (*Megarhynchus pitangua*).

Above olivaceous, more or less green; wings, upper tail-coverts and tail greyish-brown; the flights with paler edges, more or less rufescent on inner primaries and outer secondaries; tail feathers similarly edged; head brownish-black with a concealed streak or patch of canary-yellow or orange on the crown; a broad white eyebrow-stripe joining a narrow line of the same colour which passes round the nape; chin, throat, and lower part of cheeks white; remainder of under surface canary-yellow; bill black; feet black; irides brown. Female with the throat less purely white; the tail longer; the bill, seen from above, is slightly shorter and noticeably broader at base. Hab., Southern Mexico and Central and South America down to Paraguay. (Sclater.)

Excepting for the shape of its bill, this curious species is very similar to the preceding. Ridgway calls it "Boat-billed." Burmeister remarks ("Systematische Uebersicht," Vol. II., p. 459): "This remarkable bird is indeed nowhere rare in the coastal forest region of Brazil, but by no means so abundant as the Bentavi; it keeps more to the forest, far from human habitations, and is readily recognisable here by a cry which sounds like *Gne-i, Gne-i*. It is watchful, cautious, now busy on the treetop, now on the ground, but occasionally, like the Bentavi, remains at the same spot exercising its voice. Its food consists of the larger insects. The nest is carefully concealed and fairly large; it rarely contains more than two pale yellow eggs with small brown spots, especially at the blunter end, but not

sprinkled exactly thickly. These are of quite the size of the larger Thrush eggs (*Turdus viscivorus*)." *

Burmeister does not say whether this species, like *P. sulphuratus* and allies, builds a domed nest; but Professor Ridgway ("Birds of North and Middle America," Vol. IV., p. 664) says: "Nest and eggs similar to those of *Pitangus*."

It seems probable that the diet of this Tyrant would be much more varied than is suggested by Burmeister; and I should certainly try it with small newts and minnows, as I did my Sulphury Tyrant, which, after banging them limp against his perch, swallowed them with great delight.

The London Zoological Gardens acquired four specimens of this Tyrant in 1867; it reached the Amsterdam Gardens a year earlier.

Black-capped Tyrant (*Empidias fuscus*).

Above dull greyish olivaceous; wings blackish; the coverts and secondaries with whitish edges; tail blackish, the outer feathers with whitish edges; crown blackish; below sordid yellowish-white; sides and flanks somewhat ashy; under wing-coverts white; bill dark horn-colour—black (Russ); feet black; irides brown. Female not differentiated. Hab., Eastern North America (in summer) and south to Mexico. (Sclater.)

Major Charles Bendire ("Life Histories of North American Birds," Vol. II., pp. 272-276) publishes a very long account of this species, from which I cull the following:—"The Indians call them 'Moose-birds,' as they often use moose-hair in lining their nests. They lay in June, and are very bold for their size, often chasing Hawks and Crows.

"Their flight is swift and strong when in pursuit of an enemy or while in quest of food, but ordinarily it consists of slow, fluttering movements from point to point, especially during the mating season, and it is then never protracted.

"The Phœbe, like our equally well-known Robin and Bluebird, is one of the first migrants to return from its winter home, and is quite as well known and fully as popular. It usually arrives in our Middle States during the first half of March, and a little later farther north, although occasional stragglers have been observed in Maine and northern New York during the first week in this month. The males precede the females by about a week or ten days, and move direct to their breeding grounds; mating and nest-building usually beginning about a month later. Few of our native birds are more esteemed than the homely and plainly-coloured Phœbe, and its return to the old haunts is generally looked for with pleasure. No bird is more attached to a locality once chosen for a nesting site, and no reasonable amount of annoyance and disturbance will cause it to forsake its old home. It may possibly change the location for good cause, but if it does it will usually select another in the immediate vicinity. It would be difficult to name many native birds who do more good in a general way and less harm than the Phœbe. Its food consists mainly of small beetles, flies, moths, butterflies, etc., of which it destroys an enormous number, as it is scarcely ever at rest, darting after passing insects and catching them both on the wing and on the ground. It seems to be always hungry, and invariably finds room for another choice morsel. It is said to help itself occasionally to trout-fry, but the damage caused in this respect must be very trifling, and is fully compensated for by the good it does through the destruction of many noxious insects; and, in my opinion, it deserves the fullest protection. After the berry season commences it also feeds to some extent in summer on raspberries, strawberries, mulberries, and pokeberries, and in winter on cedar berries, palmetto berries, smilax berries, and wild grapes. It is one of the most restless little creatures I know; even while perching on a fence-post, the gable of an outbuilding, or a weed-stalk, its crest is often raised and lowered, its tail is forever twitching, and it appears to be unable to remain motionless for more than a minute at a time.

"Dr. Ralph tells me that in Florida the Phœbe frequently alights on the backs of cattle and follows them around, catching the flies on these animals and fluttering above them in search of insects. Their rather plaintive call notes, given by most writers as 'phœbe, pe-wee, phe-be,' and 'pe-weet,' do not sound to me in that way; they appear rather to approach the words 'see-héé, see, héé,' and are sometimes varied to 'see-béé,' or 'see-whéé,' with the accent on the last syllable; this call is occasionally followed by a rattling note. Its alarm note sounds like 'tchäk-tchäk,' and during the mating season the male indulges now and then in a low, twittering warble. It utters its calls very frequently and persistently in the early spring, and for some time after its arrival, but less often during the breeding season, when the cares of housekeeping absorb more of its time."

"In well-settled sections it loves to frequent outhouses, barns, etc., in close proximity to human habitations situated near springs, etc.; here it becomes very gentle, tame, and confiding when not molested. I have frequently seen one alight within a few feet of my head and fly back and forth from its perch after passing insects, as undisturbed as if I had not been there. In mountain regions and thinly-populated tracts it is often found about rocky cliffs, along watercourses, and almost invariably near the point where a bridge spans a stream. The Phœbe is the earliest of our Flycatchers*, nidification beginning sometimes in the first week in April, but ordinarily not much before May 1, and in the northern parts of its range rarely before June. While generally of an amiable disposition toward other birds, often nesting in close proximity to the Barn Swallow, Robin, and Chimney Swift, it will not allow any of its own kind to occupy a site close to its own, fighting them persistently until driven off, and should one of the earlier arrivals presume to appropriate its old nest, war is at once declared."

"Their favourite nesting sites are under bridges and culverts, even when they are barely large enough for a person to crawl through, provided a suitable place can be found on which to place the nest; next, outbuildings, such as barns, sheds, etc., are frequently made use of; porches of houses, window sills, etc., occasionally furnish suitable sites; overhanging rocky shelves, especially in quarries, upturned roots of trees in woods, projecting banks of small streams, caves, and more rarely the sides of open wells are likewise utilised for such purposes.

"Their nests vary considerably in shape as well as in the manner of construction. If attached to the side of an overhanging rock, it is necessarily semi-circular, and mainly composed of mud pellets mixed with moss, a little grass, and occasionally a few feathers, some-

* According to Karl Euler, the nest is not concealed, but is always openly visible, usually in dead branches, but its lofty position and small size cause it to be easily overlooked. He says it is hardly worthy of the name of nest, being apparently a mere untidy platform. The eggs number two to three, pale reddish yellow, with uniformly distributed pale brown or grey-brown spots, partly washed out.

* In the United States these birds are called "Tyrant Flycatchers."—A. G. B.

what resembling the nest of our well-known Barn Swallow. If placed on a flat beam, or rafter, or on top of a post, it is circular, and sometimes but little or no mud is used in its construction."

"Incubation lasts about twelve days, and the female performs the greater part of this duty, while the male remains in the vicinity of the nest on the watch for possible intruders. The female is a close sitter, and is loth to leave the nest." "The young are large enough to leave the nest in about two weeks, and a second brood is usually reared throughout the greater part of their range.

"The nestlings are fed entirely on insect food, and consume an enormous quantity daily."

"The number of eggs to a set varies from three to eight; sets of five are most commonly found, while the extremes are very rare; an egg is deposited daily. . . . . The Phœbe's egg is usually pure white in colour; the shell is close-grained, smooth, and moderately glossy, which gradually disappears in time, leaving the shell a dull chalky white. Occasionally some of these eggs are more or less perceptibly spotted, with a few specks of reddish-brown about the larger end, but usually only one or two in a clutch are so marked, while the majority of sets are immaculate. The eggs are mostly ovate in shape."

The London Zoological Society received two examples of this Tyrant (which, by the way, are entered in their list as "*Muscicapa phœbe*. Phœbe Flycatcher.") as part of an exchange, in 1907.

Russ observes:—"For our hobby the House-Tyrant is of hardly any value, as one sees it extremely rarely in a Zoological Garden."

American Kingbird (*Tyrannus pipiri*).

Above dark slate-colour; wings blackish, primary coverts and primaries narrowly edged with grey; middle and greater coverts and secondaries edged with white; feathers of lower rump more or less edged with greyish-white; upper tail-coverts black, more or less broadly edged with white; tail black with defined white tip, the outer feathers partly edged with the same; head black; a large concealed patch of erectile bright orange or orange-red feathers on the crown; malar region and under surface white, the breast slightly washed with ashy, becoming a defined grey patch at the sides; axillaries ashy with white terminal edges; under wing-coverts pale sordid grey tipped white or whitish; bill and feet black; irides brown. Female with smaller orange patch on crown and longer primaries with less attenuated tips. Hab., Eastern North America southwards.

Major Bendire ("Life Histories," Vol. II., pp. 236-240) gives the usual exhaustive account of the wild life, from which I quote as follows: "Bold and fearless in character, yet tame and confiding in man, often preferring to live in close proximity to dwellings, in gardens and orchards, they are prime favourites with the majority of our farming population, and they well deserve their fullest protection. Few birds are more useful to the farmer; their reputation for pugnacity and reckless courage is so well established that it is almost needless to dwell on it, as it is well-known that they will boldly attack and drive off the largest of our Raptores, should one venture too near to their chosen nesting sites. Where a pair or more of these birds make their home in the vicinity of a farmhouse, the poultry-yard is not likely to suffer much, through feathered marauders at least; they are a perfect terror to all hawks, instantly darting at and rising above them, alighting on their shoulders or necks, and picking away at them most unmercifully until they are only too willing to beat a hasty retreat. The male is seemingly always on the look-out from his perch on the top branches of a tree or post for such enemies, and no matter how large they may be, a pair of Kingbirds is more than a match for any of them, our larger Falcons and Eagles not excepted. Crows and Blue Jays seem to be especially obnoxious to them, and instances are on record where they have done them material injury.

"From the foregoing it must not be assumed that our Kingbirds are generally quarrelsome, and that they bully all other birds, as this is by no means the case. As a rule they live in perfect harmony with all their smaller relatives, and some of the latter's nests are not infrequently placed within a few feet of one of theirs, in the same tree, like that of the Orchard Orioles, for instance; and they are not content with protecting their own young and eggs, but watch over those of their neighbours as well. The only species I have observed as being on bad terms with the Kingbird is our little

American Kingbird.

Ruby-throated Hummingbird, which is well known to be, if possible, even more aggressive and pugnacious than the former, and it would seem as if, small though he may be, he is a match for the average Kingbird, and probably always the aggressor. I have on two occasions seen a Ruby-throated Hummingbird put the other to flight.

"They arrive in our Southern States from their winter homes about the first two weeks in April, and move gradually northward, generally making their appearance in the more northern States about the middle of May. The return migration from the far north commences in the beginning of August, and from our Northern States usually in the latter part of this month."

"The Kingbirds are rather noisy on their first arrival in the spring, and give free vent to their exuberance of spirits; they are very restless at this time, now hovering or fluttering slowly from one tree to another, or from fence post to fence post, the male following his mate with a peculiar, quivering movement of the wings and expanded tail, uttering at the same time a succession of shrill, twittering notes like 'pthsee pthsee,' varied now and then with other calls which are rather difficult to express in print; one of these sounds like 'twip-ip-ip-ip.' Occasionally their flight is apparently accomplished without perceptible movements of the

wings, as if gliding along in the air, and again they speed away with the swiftness of an arrow in pursuit of an insect or an enemy, doubling on it with the greatest ease. The males are especially pugnacious during the mating season, and fierce combats ensue between rivals for the possession of the coveted female; but after they are mated they rarely fight among themselves, but quickly come to each other's assistance against a common enemy.

"From the observations made in the United States Department of Agriculture, about 90 per cent. of the food of this species consists of animal matter, principally beetles, grasshoppers, butterflies, spiders, wild bees, wasps, and millipeds; to this list can be added caterpillars, different species of flies, like the large black gadfly, so annoying to horses and cattle during the summer months, and small minnows." "The vegetable matter found in their stomachs consists mainly of sassafras and spicebush berries, wild chokeberries, juniper and dogwood berries, mulberries, blackberries, huckleberries, elderberries, pokeberries, and frost grapes." "The indigestible portions, like the wing covers of beetles, the legs of grasshoppers, and seeds of berries, are ejected in pellets. The Kingbird loves a rather open country, and is rarely found nesting at any great distance from water, and it shuns densely-timbered tracts.

"In the more southern section of its breeding range nidification begins usually in the first half of May, while in northern New York and our North-Western States it rarely nests before June, more generally in the latter part of this month, and still later in the extreme northern parts of its range. The nests are placed in various kinds of trees, such as apple, pear, tulip, chestnut, elm, poplar, cottonwood, willow, oak, sycamore, osage, orange, cedar, maple, birch, hawthorn, locust, wild plum, orange, and lemon, as well as in shrubs and bushes of different kinds, generally at a distance of from four to forty feet from the ground. They are usually placed in a fork or crutch on a horizontal branch, and frequently well out on the limb. They are not at all particular in the selection of a nesting site; I have seen nests placed on a fence rail (sometimes on top of one), and again between the rails, not over two feet from the ground, in the hollow tops of stumps, and in abandoned nests of the Robin and the Bronzed Grackle.

"The Kingbird, like many other species, after selecting a suitable nesting site and raising its young unmolested, will generally return to it from year to year. The nest is usually well and compactly built, and varies more or less in size and bulk, according to the site. A typical nest now before me, taken by Dr. Edgar A. Mearns, United States Army, near Fort Snelling, Minnesota, measures about 5½ inches in outer diameter by 3¼ inches in depth; its inner diameter is 3 inches by 1¾ inches deep. Its exterior is constructed of small twigs and dry weed stems, mixed with cottonwood down, pieces of twine, and a little hair. The inner cup is lined with fine dry grass, a few rootlets, and a small quantity of horsehair. In other specimens bits of wool, strips of bark, thistle-down, cattle-hair, and fine rootlets are incorporated in the body of the nest.*

"The male assists in the construction of the nest, and to some extent in the duties of incubation. He relieves the female from time to time to allow her to feed, guards the nesting site, and is usually perched on a limb close by, where he has a good view of the surroundings. Even when so engaged he rarely sits entirely quiet, but every few minutes elevates his crest, and looks around for a possible enemy. An egg is deposited daily, and incubation lasts from twelve to thirteen days. The young, while in the nest, are fed entirely on animal food, and are able to leave it in about two weeks after hatching, and soon learn to provide for themselves. A second brood is occasionally raised in the more southern portions of their breeding range.

"The Kingbird is not particularly sociable, each pair keeping pretty much to themselves during the breeding season, and later in family parties, until the winter migration commences, when they gather in flocks and depart for the south.

"Three or four eggs are laid to a set; in some localities three seems to be the rule. This is especially the case in the more southern portions of their breeding range, while farther north they generally lay four. Although the Kingbird is credited by several writers as laying from three to five eggs, and sometimes even six, I have never seen a larger set than four among the many examined, and sets of even five eggs must be considered as very unusual. The ground-colour of these eggs varies from white or pale creamy-white to a very faint rose-pink, and they are spotted and blotched with chestnut, claret-brown, cinnamon, rufous, heliotrope-purple, and lavender. The markings vary greatly both in size and quantity, but are generally heaviest about the larger end of the egg. In the more finely-marked specimens the spots are usually more profuse and evenly distributed, and occasionally an almost unmarked egg is found. The shell is rather smooth, close-grained, moderately strong, and slightly glossy. The eggs are mostly ovate in shape, ranging from this to short and rounded ovate, and a few are elongate ovate.

"The average measurement of 140 eggs in the United States National Museum collection is 24.06 by 18.21 millimetres, or about 0.95 by 0.72 inch."

Dr. Russ speaks of this bird as rare in the market, and never to be regularly met with even in zoological gardens, whilst it is hardly ever exhibited by aviculturists, although he knew of an example in the possession of E. von Schlechtendal, who kept it in a flight-cage, where it fluttered about with a gentle, weak flight, like a great butterfly, now against the wires and now on to the food-pan. He thinks that if in perfect plumage it ought to be kept in a very large aviary in order to show off its flying powers. It has been exhibited at the London Zoological Gardens.

Melancholy Tyrant (*Tyrannus melancholicus*).

Above greenish-grey; wings and tail dusky blackish, with more or less pale edges; crown with a crest of erectile scarlet and yellow feathers; throat greyish-white; rest of body below yellow, more or less greyish on the breast; under wing coverts pale yellow; bill and feet black; irides brown. Female not differentiated, but probably with smaller crest and less attenuated outer primaries. "Hab., Mexico and Central and South America down to Buenos Ayres." (Sclater.)

Hudson says ("Argentine Ornithology," Vol. I., pp. 158-160):—"The violent and bold temper exhibited by most Tyrant-birds during the breeding season—a quality from which is derived the name of the family, is perhaps carried to a greater degree in this species than in any other; and when one spends many days or weeks in the marshy, littoral forests, where the bird is most abundant, and hears its incessant distressful screams, the specific name *melancholicus* does not seem altogether inappropriate; and that is the most that can be said of any specific name invented by science, and which

* Major Bendire then proceeds to describe other nests, varying more or less in the materials employed. Doubtless, as with other birds, the materials which are most handy in the particular neighbourhood are used.

does not merely describe some peculiarity of form or colour.

"This Tyrant is one of the largest of its kind, its total length being nearly 9 in. The wings are long and suited for an aerial life; the legs are exceedingly short, and the feet are used for perching only, for this species never alights on the ground."

"In Buenos Ayres these birds arrive in September, after which their shrill, angry cries are incessantly heard, while the birds are seen pursuing each other through the air or in and out amongst the trees—perpetually driven about by the contending passions of love, jealousy, and rage. As soon as their domestic broils are over, a fresh war against the whole feathered race begins, which does not cease until the business of propagation is finished. I have frequently spent hours watching the male successively attacking, with scarcely an interval of rest, every bird, big or little, approaching the sacred tree where its nest was placed. Its indignation at the sight of a cowardly Carrion-Hawk (*Milvago*) skulking about in search of small birds'-nests, and the boundless fury of its onset, were wonderful to witness.

"They are extremely active, and when not engaged in their endless aerial battles, are pursuing large insects on the wing, usually returning after each capture to their stand, from which they keep a jealous watch on the movements of all winged things about them. They are fond of marshy places and water-courses, where they perch on a tall stalk to watch for insects, and also frequently skim over the water like Swallows to drink and dip their feathers.

"A tall tree is usually selected for the nest, which is not infrequently placed on the very topmost twigs, exposed to the sight of every creature passing overhead, and as if in defiance of birds of prey. With such an aggressive temper as this bird possesses, it is not strange perhaps that it builds in the most exposed places, from which the female, in the absence of her vigilant consort, can keep a sharp eye on the movements of her feathered neighbours; but I have often thought it singular that they do not make a deeper receptacle for their eggs, for the nest is merely a slight platform of slender sticks, and very ill-adapted to retain its burden during high winds. The parasitical Cowbird never enters this nest, which is not strange.

"The eggs are four in number, small for the bird, pointed, parchment-white, spotted with dark brown at the larger end."

The London Zoological Gardens acquired an example of this Tyrant in 1893.

Fork-tailed Tyrant (*Milvulus tyrannus*).

Above ashy; rump blackish; wings dark brown; three outer primaries attenuated at tips; tail black, the outermost feather with white outer web; crown black, with concealed yellow crest; below white; bill and feet black. Female differs in the shorter outer tail feathers. Hab., Mexico, and Central and South America as far south as Patagonia.

Hudson says ("Argentine Ornithology," Vol. I., pp. 160, 161):—"During flight the two long feathers of the tail stream out behind like a pair of black ribbons; frequently the bird pauses suddenly in its flight, and then the two long feathers open out in the form of the letter V.

"The Scissor-tail is migratory, and arrives, already mated, at Buenos Ayres at the end of September, and takes its departure at the end of February in families—old and young birds together. In disposition and general habits it resembles the true Tyrant-birds, but differs from them in language, its various chirping and twittering notes having a hard percussive sound, which Azara well compares to the snapping of castanets. It prefers open situations with scattered trees and bushes, and is also partial to marshy grounds, where it takes up a position on an elevated stalk to watch for insects, and seizes them in the air like the Flycatchers. It also greedily devours elderberries and other small fruits.

"The nest is not deep, but is much more elaborately constructed than is usual with the Tyrants. Soft materials are preferred, and in many cases the nests are composed almost exclusively of wool. The inside is cup-shaped, with a flat bottom, and is smooth and hard, the thistle-down with which it is lined being cemented with gum. The eggs are four, sharply pointed, light cream-colour, and spotted, chiefly at the large end, with chocolate. In the breeding-time these Tyrants attack other birds approaching the nest with great spirit, and have a particular hatred to the Chimango, pursuing it with the greatest violence through the air with angry notes, resembling in sound the whetting of a scythe, but uttered with great rapidity and emphasis. How greatly this species is imposed upon by the Cow-bird, notwithstanding its pugnacious temper, we have already seen in my account of that bird.

"The Scissor-tail has one remarkable habit; they are not gregarious, but once every day, just before the sun sets, all the birds living near together rise to the tops of the trees, calling to one another with loud, excited chirps, and then mount upwards like rockets to a great height in the air; then, after whirling about for a few moments, they precipitate themselves downward with the greatest violence, opening and shutting their tails during their wild zigzag flight, and uttering a succession of sharp, grinding notes. After this curious performance, they separate in pairs, and, perching on the tree-tops, each couple utters together its rattling castanet notes, after which the company breaks up."

Dr. Russ does not mention this species, but the London Zoological Gardens purchased a specimen in April, 1893.

CHATTERERS (*Cotingidæ*)

Birds of the New World, some of which are brilliantly coloured, though others are sombre in hues. Like the Tyrants, they have all ten primaries well developed, though in the sub-family to which Dr. Sclater has given the name *Tityrinæ* the second (now called the ninth) primary is shortened and lanceolate. They are nearly related to the *Pipridæ*, which systematic ornithologists have unfortunately called Manakins, thus rendering them liable to be confounded with the Finches generally recognised as Mannikins, to which, of course, they have no affinity whatever. The Chatterers are fruit-eating birds, and in captivity might be treated much in the same manner as Tanagers.

Cock of the Rock (*Rupicola crocea*).

Bright orange; head with large compressed crest; wings brown, broadly belted with white; outer edges and broad tips of secondaries pale orange, the outer secondaries with their outer webs prolonged into filaments; tail blackish-brown with pale orange extremity; bill and feet yellowish. Female olive-brown; rump, tail, abdomen, and under wing-coverts washed with orange-brown. Hab., Guiana, Cayenne, and Lower Amazons. (Sclater.)

Burmeister says ("Systematische Uebersicht," Vol. II., p. 437): "Inhabits the regions of the interior of South America, which abound in rocks, particularly the northern districts; feeds upon soft fruits, prefer

ably berries; nidificates in open nests among rocks; breeds twice (December and April), and lays two whitish eggs, tolerably densely speckled with yellowish-brown."

C. A. Lloyd ("Timehri," New Series, Vol. IX., p. 231, 1895) observes: "We fell in with a young Indian and his wife, the latter carrying a 'quake' containing a beautiful male Cock-of-the-Rock (*Rupicola crocea*) in splendid plumage, which we offered to purchase, but which she refused to sell. She told us, however, that we could secure the birds in great numbers hard by, and that this month (March) was their nesting season. We decided on camping at a settlement not far off to try and procure specimens, with their nests and eggs. Accordingly, on reaching the village, we halted for the balance of the afternoon, and, in company with one of our men, started off at once in search of their building-place, which we soon found, and succeeded in taking a couple of nests. They each contained two speckled eggs, a little larger than those of a Pigeon. The nests are placed on the bare rocks, and constructed of palm-fibres stuck together by a kind of gum. These were the only two nests that we found with eggs, although we saw many deserted ones. The birds feed on the fruit of a palm, which seems to be a species of *Œnocarpus*, and, judging from their harsh cries around us, they must have been very plentiful, but we never caught sight of one. The Macoushis call the bird *Kavanara*."

Two examples of this large and handsome species were presented to the Regent's Park Gardens in 1866, one in 1868, one was purchased in 1875, two in 1877, one in 1878, and the last two examples (males) were presented in 1885; yet, oddly enough, Dr. Russ seems to have entirely overlooked the species; whilst of other *Cotingidæ* he describes several which have never been imported.

Banded Chatterer (*Cotinga cincta*).

Bright sky-blue; wings and tail black; throat, breast (excepting a narrow belt of blue) and centre of abdomen bright magenta-purplish; under wing-coverts black washed with blue; bill and feet black. Female above blackish, the feathers edged with bright buff; below rufescent buff, the feathers with central black spots; wing-feathers with buff margins to inner webs. Hab., South-east Brazil. (Sclater.)

Burmeister says ("Systematische Uebersicht," Vol. II., p. 431): "This species, certainly the most beautiful of all, inhabits the coastal forest region of Brazil, and extends down as far as Rio de Janeiro, but scarcely any farther; it was once brought to me by my collectors in both sexes at New Freiburg, but too much shot about for me to be able to preserve the skins. The Prince zu Wied obtained his specimens at Rio St. Matthaüs and Rio Mucuri, and again later at Bahia. According to him the bird does not nest in those localities, but in the interior, only arrives there in the cold season of the year (May to October), and then hunts for berries through the forests, utters a short, loud call-note, and in its behaviour entirely resembles our Waxwing. There it bears the name Crejoa or Kirna, from which the scientific name *Cotinga* appears to be derived." *

In Prince zu Wied's own account very little additional information is given; he says it has not a pleasant voice, is very stupid and easy to shoot, feeds on various berries and fruits, and is very good eating. I have not been able to discover anything about its nidification.

* I must confess that I fail to see the resemblance myself.—A. G. B.

Russ says that it is extremely rarely met with in the bird-market, and always singly. Specimens were purchased by the London Zoological Society in 1875 and 1877, and one reached the Berlin Gardens in 1891, respecting which Mr. Meusel observes that it improved in brilliance and beauty each year, attaining its most perfect plumage in 1895.

Russ describes two other species of *Cotinga*, neither of which appears ever to have been imported; he also gives quite a long account of the Snowy Bell-bird (*Chasmorhynchus nivens*); why, I do not understand.†

Naked-throated Bell-bird. (*Chasmorhynchus nudicollis*).

White; sides of head and throat naked, greenish, and dotted with scattered black bristles; bill dark brown; feet brownish flesh-coloured; irides clear brown. Female above olive-green; the crown to the nape black-brownish; the parts which are naked in the cock clothed with small yellowish-green feathers; under-parts yellowish; each feather with a yellowish-green shaft-stripe; feet darker flesh-coloured. Hab., S.E. Brazil.

Burmeister remarks ("Systematische Uebersicht," Vol. II., p. 427): "The Ferrador, as the Brazilians of the tract which I travelled over call this bird, is there everywhere known, on account of its loud far-sounding voice, which has considerable likeness to the sound of a cow-bell or the tone of a hammer striking upon an anvil; moreover, it sometimes rises somewhat, or, again, drops, and consists of single sounds repeated at intervals. It lives deep in the interior of the forest, is sluggish, occurs singly or in pairs, and never occurs in the vicinity of human settlements. Its chief resorts are the mountain woodlands of the narrow valleys of the coastal region; it is not to be met with near the sea-shore."

"The food of the bird consists preferably of fleshy berries, with which its crop is filled to its greatest capacity; yet it also feeds upon insects, but only by way of variety. So far nobody is acquainted with its nest."

In *The Ibis* for 1905, pp. 174-5, Dr. E. A. Goeldi confirms the statement that berries form a normal part of the natural food of this Bell-bird, but he throws no additional light upon its wild life.

Other writers upon the wild life of this species seem to have confined their observations chiefly to the character of its song.

As regards its food in captivity Mr. Ernest Dulitz seems to have fed his specimen on various fruits, such as china-orange, raisins, etc., sometimes mixed with boiled rice; it appeared to despise mealworms. During the moult Brehm chiefly fed the species on a mess of mashed cooked potato, carrot, or parsnip, and boiled Malayan rice, with fruit daily as variety, but especially bananas.

The Naked-throated Bell-bird has repeatedly reached the London Zoological Gardens since 1866, and certainly as lately as 1899, when the note of the bird is remarked upon in *The Ibis* as differing from that of *C. niveus*.

Snowy Bell-bird (*Chasmorhynchus niveus*).

"Snow-white; head with a long thinly-feathered caruncle arising from the front; bill and feet black; whole length 10.5 inches, wing 6.5, tail 4. Female: Above green, beneath yellowish, variegated with green;

† At that time it had only just arrived at the London Zoological Gardens.

crissum yellowish. Hab., Cayenne, Surinam, and Guiana." (Sclater.)

The late Henry Whitely obtained this bird at Roraima at an altitude of 3,500 feet. (*The Ibis*, 1885, p. 306.)

Schomburgh says (cf. Russ, "Die Fremdländischen Stubenvögel," Vol. II., p. 460) :—"I became aware of marvellous sounds issuing from the neighbouring forest, such as I had never before heard. It was as though one were striking simultaneously several harmoniously voiced glass bells. Now I heard it again, and after a pause of a minute's duration, again and again. Then a somewhat longer interval of six to eight minutes ensued and once more the full harmonious sounds rang out. I stood quite a long time chained with wonder and watched to see whether the incredible sounds might not be heard once more; but they were silent; and full of desire, I betook myself with the question to my brother, from whom I learnt that this was the note of the Bell-bird. That birds in Guiana possessed the gift of speech I had already discovered; but such sounds had hitherto remained quite unknown to me and my attention could not for the time be diverted at all from this marvellous songster. Near the coast the Bell-bird belongs to the birds of passage; it usually arrives at Demerara and Berbice in May and June, yet it never goes quite close to the coast. It chiefly prefers mountain forests, yet only up to an altitude of from 400 to 500 feet. It utters its magical, bell-clear notes chiefly from the outermost branch of a gigantic mora-tree, which it more particularly selects, if there is a dead branch on it. I have never observed two males on one tree, nevertheless they are fond of answering one another from different trees near together. Every morning they greet the young day with their clear metallic notes, and of all songsters they take their departure latest from the setting sun. When at rest the caruncle of the bill hangs down laterally, but when the Bell-bird utters his call, he puffs up the caruncle, which draws itself round with the point towards its own base; if he only utters a single note, the caruncle instantly rises up, but drops immediately again after the utterance of the sound, yet erecting itself again with the next cry. The females with their silky Siskin-green plumage never roost so high as the males, but continually settle on the lower branches of the forest trees; altogether I have only come across a few of them, the reason of which may indeed be that they are consistently quite silent, and owing to their green plumage they can only be perceived with difficulty in the green foliage of the trees. The young males look extraordinary in the transition plumage from green to white; in the second year they possess a completely pied feathering, and only in the third year do they possess the fully coloured clothing of the adult male."

I have been unable to discover any notes on the nidification of this species. The London Zoological Society acquired a specimen in 1899.

Pied Bell-bird (*Chasmorhynchus variegatus*).

Pure white; wings black; head, including nape and ear-coverts coffee-brown; throat naked, black, and covered with small fleshy worm-like black caruncles; bill and feet black; irides brown. Female above dull green; wings blackish-brown; head greyish; below pale yellowish, streaked on breast and abdomen with green; throat dark greyish, more finely streaked. Hab., Guiana, Venezuela, and Trinidad.

According to Goering, "the Chaymas Indians do not call this Bell-bird (Campanero) like the preceding species, but Herréro, that is to say Smith; and correctly, since its call, which sounds as if one were striking an anvil violently with a hammer, never has a bell-like intonation. The Smith is distributed widely over Venezuela, and occurs also in the westerly parts of the country, where it appears especially to favour the mountainous regions, and is nowhere rare." At the beginning of 1870 this Bell-bird was represented in the Zoological Gardens of Cologne; according to Mr. T. Hesse, of Cologne, its food consists of berries and other fruit, and its call-note sounds as though one struck a wineglass with a knife.

Tricarunculated Bell-bird (*Chasmorhynchus tricarunculatus*).

Reddish-chestnut; head and throat white; forehead, lores, and angles of lower bill naked and black; at middle of forehead and from both angles of the bill a long, narrow, blackish naked caruncle; bill and feet black; irides not described. Female smaller, with shorter caruncles; above olive-green; throat yellow; body below yellowish-green, longitudinally boldly streaked with olive-greenish-brown. Hab., Costa Rica and Veragua.

According to Russ, Dr. Frantzius says: "This interesting species is distributed over the primitive forests of Costa Rica; nevertheless it has given me great trouble to acquire its female, although it is by no means rarer than the male. The Siskin-green of its plumage, which also corresponds with that of the young male in all respects, easily conceals the bird from the sight of the collector, whilst even the adult male, with its snow-white and cinnamon-brown colouring, is not easily discernible in the green foliage; moreover the female is very silent, whereas the male readily betrays itself by its voice. Then, again, the hunters in Costa Rica are always inclined to ignore birds with inconspicuous plumage, and only to secure the strikingly-coloured ones, as, according to their view, the value of a bird consists in its gaily-coloured plumage."

I have discovered no further notes respecting the living bird. Russ says: "This bird hitherto has been extremely rarely imported with us; the records of the great Zoological Gardens do not contain it.

OVEN-BIRDS (*Dendrocolaptidæ*).

These are birds not remarkable for beauty, but of considerable interest on account of the singular mud nests which they construct in most conspicuous situations. By scientists these birds are placed, on account of their anatomical stucture, in the group *Tracheophonæ*. They are related to the so-called Miners, Earth-creepers, Leaf-scrapers, Spine-tails, Wood-hewers, etc. Their food in a wild state consists of larvæ and worms, and in captivity they should do well if treated much in the same manner as Thrushes.*

Red Oven-Bird (*Furnarius rufus*).

Rufescent earth-brown; wings mostly blackish with pale brown edges, but outer secondaries wholly pale earthy-brown; upper tail-coverts and tail bright rusty red-brown; under surface white, with the breast, flanks, under wing-coverts, and a broad belt across base of wing pale buffish; bill and feet horn-colour; irides golden-brown. Female slightly smaller, with shorter and more slender bill, throat less purely white, and

* Azara fed an example in his possession upon boiled rice and raw meat; but I have always found the latter dangerous food for softbills; he only kept it alive one month.

centre of abdomen more stained with brownish. Hab., Argentina, Uruguay, and Paraguay.

Hudson says ("Argentine Ornithology," Vol. I., pp. 167-170): "This species is usually named *Hornero* or *Casera* (Oven-bird or House-builder) in Argentina, but in Paraguay and Corrientes *Alonzo Garsia* or *Alonzito*." He continues: "I have frequently been assured by natives that the Hornero is a pious bird, and always suspends its labours on sacred days. With this pretty belief about it in their minds it is not strange that in some districts they have called it by a human name.

"It is resident, pairs for life, and finds its food, which consists of larvæ and worms, exclusively on the ground. It delights in open places, where it can move freely about on the ground, and is partial to courtyards, clean garden-walks, etc., where, with head thrown back and bosom prominent, it struts along with an air of great gravity, lifting its foot high at each step, and holding it suspended for a moment in the air before setting it firmly down. I once saw one fly down on to a narrow plank about 10ft. long lying out on the wet grass; it walked gravely to the end of the plank, then turned and deliberately walked back to the other end, and so on for about twenty times, appearing to take the greatest pleasure in the mere act of promenading on a smooth, level surface. When disturbed the Oven-bird has a loud, monotonous note of alarm or curiosity, which never fails to bring all its fellows within hearing distance to the spot. The movements of a fox, weasel, or cat in a plantation can always be known from the noisy turmoil among the Oven-birds. At frequent intervals during the day the male and female meet and express their joy in clear, resonant notes sung in concert —a habit common to a very large number of Dendrocolaptine birds, including, I think, all those species which pair for life. In a majority of species this vocal performance merely consists of a succession of confused notes or cries, uttered with great spirit and emphasis; in the Oven-bird it has developed into a kind of harmonious singing. Thus, the first bird, on the appearance of its mate flying to the place of meeting, emits loud measured notes, sometimes a continuous trilling note with a somewhat hollow metallic sound; but immediately on the other bird joining, this introductory passage is changed to rapid triplets, strongly accented on the first and last notes, while the second bird utters a series of loud measured notes perfectly according with the triplets of the first. While thus singing they stand facing each other, their necks outstretched, wings hanging and tail spread, the first bird trembling with its rapid utterances, the second beating on the branch with its wings. The finale consists of three or four notes uttered by the second bird alone, and becoming successively louder and more piercing until the end. There is an infinite variety in the tone in which different couples sing, also in the order in which the different notes are uttered, and even the same couple do not repeat their duet in precisely the same way; but it is always a rhythmical and, to some extent, an harmonious performance, and as the voices have a ringing, joyous character, it always produces a pleasing effect on the mind.

"In favourable seasons the Oven-birds begin building in the autumn, and the work is resumed during the winter whenever there is a spell of mild wet weather. Some of their structures are finished early in winter, others not until spring, everything depending on the weather and the condition of the birds. In cold dry weather, and when food is scarce, they do not work at all. The site chosen is a stout horizontal branch, or the top of a post, and they also frequently build on a cornice or the roof of a house, and sometimes, but rarely, on the ground. The material used is mud, with the addition of horsehair or slender fibrous rootlets, which make the structure harder and prevent it from cracking. I have frequently seen a bird, engaged in building, first pick up a thread or hair, then repair to a puddle, where it was worked into a pellet of mud about the size of a filbert, then carried to the nest. When finished the structure is shaped outwardly like a baker's oven, only with a deeper and narrower entrance. It is always placed very conspicuously and with the entrance facing a building, if one be near, or if at a roadside it looks toward the road; the reason for this being, no doubt, that the bird keeps a cautious eye on the movements of people near it while building, and so leaves the nest opened and unfinished on that side until the last, and there the entrance is necessarily formed. When the structure has assumed the globular form with only a narrow opening, the wall on one side is curved inwards, reaching from the floor to the dome, and at the inner extremity an aperture is left to admit the bird to the interior or second chamber, in which the eggs are laid. A man's hand fits easily into the first or entrance chamber, but cannot be twisted about so as to reach the eggs in the interior cavity, the entrance being so small and high up. The interior is lined with dry, soft grass, and five white, pear-shaped eggs are laid. The *oven* is a foot or more in diameter, and is sometimes very massive, weighing eight or nine pounds, and so strong that, unless loosened by the swaying of the branch, it often remains unharmed for two or three years. The birds incubate by turns, and when one returns from the feeding-ground it sings its loud notes, on which the sitting bird rushes forth to join in the joyous chorus, and then flies away, the other taking its place on the eggs. The young are exceedingly garrulous, and when only half fledged may be heard practising trills and duets in their secure oven, in shrill, tremulous voices, which change to the usual hunger-cry of young birds when the parent enters with food. After leaving the nest, the old and young birds live for two or three months together, only one brood being raised in each year. A new oven is built every year, and I have more than once seen a second oven built on the top of the first when this has been placed very advantageously, as on a projection and against a wall."

Russ observes: "This Oven-bird arrives in our market extremely rarely and singly; it first reached the London Zoological Gardens in the year 1873, then the wholesale dealers advertised it from time to time as a single example, and lastly, in the year 1887, it arrived also at the Zoological Gardens of Amsterdam."

In 1893 the London Zoological Society purchased two examples; in 1903 several examples were imported, and I was offered a pair, but did not care to add to the number of my insectivorous birds. I believe they were purchased by my friend Mr. Seth-Smith, since I certainly saw a pair at his house. If I remember rightly, one of them did not live very long.

CHAPTER VI.

ORDER PICARIÆ.

WOODPECKERS (*Picidæ*).

In their cranial characters these birds are related to the Kingfishers, Rollers, Bee-eaters, etc.; in the structure of their muscles and digestive organs to the Kingfishers and Hoopoes. Their tongue is long and worm-like, with spiny tip, and is coated with a viscid secretion by the action of the salivary glands; a muscle known as the *genio-hyoideus*, arising from near the middle of the mandibular bar, extends as a ribbon to the hyoid bone, round which it twists loosely, and being attached to the dorsal extremity, the contraction of the spiral surrounding the hyoid horns protrudes them with great force to a remarkable extent, thus enabling the bird to coax out of their retreats the grubs which form its food (*cf.*, Newton, "Dictionary of Birds," pp. 619, 620, and 975).*

The Woodpeckers are climbing birds; two toes being directed forwards and two backwards, their tails consisting of ten to twelve stiff feathers, which help to support them when ascending a tree; even the Wrynecks, which have soft tail-feathers, press them against the surface up which they are mounting, as I have myself observed in captive birds. The bills of Woodpeckers are long and wedge-shaped, enabling them to bore into trees in which they nest; they do not build, but lay their eggs upon the chips and rotten wood at the bottom of the tunnel or boring; the eggs are smooth and white; they are chiefly insectivorous, feeding largely upon insects and their larvæ, which they dig out of rotten wood or extract from the holes in which they are concealed; ants, too, enter largely into their bill of fare, as also berries and fruits.

In captivity, Woodpeckers cannot be associated with other birds, nor must two species of the family be kept together on account of their pugnacity; even young from the same nest are liable to fight at an early age. They can be fed in confinement upon finely-scraped raw beef mixed with soaked breadcrumbs and egg, crushed hemp, nuts, small fruits, but always plenty of living insects. Personally, I should substitute a good insectivorous food for the scraped beef, as the latter always has a tendency to relax the bowels and produce cramp or fits; I have, however, kept none of the foreign Woodpeckers myself.

Dr. Russ gives a very full account of *Campophilus principalis*, the "Ivory-billed Woodpecker" of North America, but I cannot discover that it has ever been imported into Europe.

GOLDEN-WINGED WOODPECKER (*Colaptes auratus*).

Back, scapulars and wing-coverts drab-brown with narrow black bars; rump and upper tail-coverts white, the latter barred and mottled with black; flights blackish brown, with golden yellow shafts; the primaries with a few sordid white spots towards base of outer webs, the margins of inner webs more or less buffy white; innermost secondaries barred throughout with drab, the others with drab-spotted outer webs and the margins of inner webs margined with buffy white; tail black, the shafts (excepting of the two central feathers, which are only yellow at base) golden yellow, more or less deeply tipped with black; outer feather white-tipped and with a few buff-whitish specks on outer web; crown and hind neck smoky grey; nuchal band scarlet; nasal plumes, lores, and eyebrow reddish; face, chin, throat and fore neck vinous reddish drab; a moustachial streak and a broad crescentic patch on the chest, black; body below white, more or less suffused with vinous drab and spotted with black; under tail-coverts white, barred and mottled with black; under wing-coverts pale buff, edge of wing white with black spots; axillaries yellowish white; flights and tail-feathers below mostly golden yellow. Female differs in wanting the black moustachial streak. Hab., "Eastern United States west to the Great Plains, north to Hudson's Bay and Alaska, occurring occasionally on the Pacific Slope of the Rocky Mountains from California northwards." (Hargitt.)

In his "Ornithology of California" J. G. Cooper does not describe this species, but refers to hybrids between *C. mexicanus* and *C. auratus* as the *C. hybridus* of Baird and *C. ayresii* of Audubon. Hargitt regards the latter as a race distinct from *C. auratus*, although presumably originally produced by hybridisation, on the assumption that it is a fertile hybrid. ("Catalogue of Birds," Vol. XVIII., p. 23.)

Major Bendire says ("Life Histories," Vol. II., pp. 130-134):—"The Flicker is one of the most sociable of our Woodpeckers, and is apparently always on good terms with its neighbours. Birds which migrate usually return to their summer homes early in April, and occasionally even in March, and one will not have far to go then without hearing some of its many and rather melodious calls. The males usually precede the females a few days, and as soon as the latter arrive one can hear their well-known voices in all directions. One of their commonest calls at this season of the year is a clear "whick-ah, whick-ah"; another sounds like "quit-u, quit-u," a number of times repeated; "tchuck-up, tchuck-up," is another familiar sound uttered by them; a far-reaching "clape, clape," is also frequently uttered, while a quickly given rolling or rattling "thee-he-he-he-he" and a low "cäck-cäck-cäck" seem to be the notes of endearment. Another call when courting its mate sounds like "ouit-ouit," and ends with a soft "puir, puir," or a cooing "yu-cah, yu-cah." Low, chuckling sounds are also frequently uttered during their love-making; another common call-note sounds like "zee-ah, zee-ah," and during the summer a clear "pi-ack, pi-ack," or "pioh," is also frequently heard; in fact, no other of our Woodpeckers utters such a variety of sounds.

"The Flicker is especially demonstrative during the mating season, and is an ardent wooer. It is an exceedingly interesting and amusing sight to see a couple of males paying their addresses to a coy and coquettish female; the apparent shyness of the suitors as they sidle up to her and as quickly retreat again, the sly glances given as one peeps from behind a limb watching the other—playing bo-peep—seem very human, and I have seen few more amusing performances than the courtship of a pair of these birds. The defeated suitor takes his rejection quite philosophically, and retreats in a dignified manner, presumably to make another trial elsewhere. I have never yet seen a pair of males fight over a coveted female. Few birds deserve our goodwill more than the handsome Golden-winged Woodpecker, and it is well entitled to all of the consideration generally shown it. Looked at from an economic point of view, it is an exceedingly useful bird, destroying

* A beautiful anatomical preparation of this structure is exhibited in the Natural History Museum at South Kensington.

many noxious insects and their larvæ, a great many of which are gleaned from the ground, as it is far more terrestrial in its habits than any other member of this family. Its beak is frequently covered with soil from digging in pastures after grubs and earthworms, and also in ant-hills after these insects or their larvæ, of which it is especially fond; it also feeds on hairless caterpillars. Different kinds of berries and fruit, such as cherries, apples, persimmons, strawberries, mulberries, raspberries, wild grapes, dogwood, whortle, poke, and sour-gum berries, and occasionally green corn, are also eaten by it. The damage it does to cultivated fruits is very trifling, and this bird deserves the fullest protection.

"In the northern portions of its range nidification begins about a couple of weeks after the birds arrive from the South, and a suitable place is then selected for a nesting site. It prefers open country, interspersed here and there with groves and orchards, to the deeper forests to nest in. It is easily pleased in this respect—any old stump, a partly decayed limb of a tree, near the outskirts of a forest, along the banks of a creek, beside a country road, or in an old orchard, will answer the purpose. A fresh cavity is usually excavated every year, but where suitable trees or stumps are not readily available the same may be occupied for several seasons in succession. In the vicinity of Washington, District of Columbia, these birds nest in the oak, ash, chestnut, elm, maple, poplar, willow, and sycamore; spruce and birches are also used, but, on the whole, softwood trees seem to be preferred to hard ones. In the Southern States it breeds frequently in pines, and in the prairie States it occasionally selects strange nesting sites. Here it has been known to chisel through the weather-boarding of dwelling-houses, barns, and other outbuildings, and to nest in the hollow space between this and the crossbeams; its nests have also been found in gate-posts where both people and stock pass constantly, in church towers, and in burrows of Kingfishers and Bank Swallows in the perpendicular banks of streams."

"Flickers nest occasionally in natural cavities, and at distances from the ground varying from 2½ feet to 60 feet, but mostly between 10 feet and 20 feet. Old, rotten stumps and dead or partly decayed trees are preferred to live ones. The entrance-hole is usually 2½ inches in diameter, and the inner cavity varies from 8 inches to 30 inches in depth. It is gradually enlarged toward the bottom, and a layer of fine chips, on which the eggs are deposited, is allowed to remain. Its flight, although apparently laborious, is strong and swift, and, like that of all Woodpeckers, undulating or wave-like. It frequently perches on a limb instead of clinging to it, as do others of the tribe. In the spring of the year it also indulges in drumming, but not to the same extent as the majority of this family."

"Nidification in the southern portions of its range begins ordinarily in the last half of March, and in the North from four to fully six weeks later. Both sexes assist in the construction of the nesting site, as well as in incubation, and the male usually does his full share of work at both. According to Dr. William L. Ralph's observations in Florida, the male usually sits on the eggs during the night. In the South fresh sets of eggs may be looked for during the first week in April, in the vicinity of Washington, District of Columbia, during the first half of May, and in the more northern parts of its range, in Alaska and the North-West Territory, about the first ten days in June."

"From five to nine eggs are usually laid to a set, mostly six or seven, but considerably larger ones are sometimes found, possibly the product of two females laying in the same nest; but the fecundity of this Woodpecker is known to be very great."

"The eggs of the Flicker are glossy white in colour, and, when fresh, appear as if enamelled; the shell is very close grained, and exceedingly lustrous, as if polished." "They are quite variable in shape; the majority are ovate, others short and elliptical ovate, and a few approach subpyriform, while some are nearly perfect ovals. An egg is deposited daily until the set is completed, and incubation lasts about fifteen days. This ordinarily does not begin until the set is completed, but now and then young birds and eggs in different stages of advancement are found in the same nest. The young are able to leave their nest in about sixteen days; they crawl about on the limbs of the tree for a couple of days before they venture to fly, and return to the nest at night."

This species first reached the London Zoological Gardens in 1864, and subsequently the Berlin, Amsterdam, and other gardens in fair numbers. Russ observes that it is by no means very rare in the market, but nevertheless it has been exceptional for aviculturists to possess it. Under the present protective laws it will be far more exceptional in future.

Striped or Rayed Woodpecker (*Chloronerpes striatus*).

Above greenish yellow, the back and scapulars broadly barred with black; the rump more narrowly barred; upper tail-coverts crimson; wings black; the coverts barred and spotted with yellow; flights with the outer webs spotted with yellow, the inner webs browner and spotted with white; tail blackish, browner, and margined externally with sordid white on outer feathers; nasal plumes, frontal band, face, chin, and throat dull ashy, browner behind; crown and nape crimson; a large elongated black patch on side of neck, preceded by a patch of yellowish-white; foreneck and chest brown passing into yellowish olive on abdomen, which becomes duller on under tail-coverts; under wing-coverts dull buffish white; upper mandible black; lower mandible whitish horn-grey; feet blue-grey; irides shiny white. Female slightly smaller, duller, and with black crown. Hab., St. Domingo and Haiti Island.

I have failed to find any account of the wild life of this species, but quote the following account, by the late Dr. Russ, of a pair which he purchased from L. Ruhe, of Alfeld, near Hanover:—"During the days in which I lodged the highly-interesting birds, the pair proved themselves uncommonly pleasing, lovable in their entire behaviour, tame and confiding. I would only too willingly have retained the charming Woodpeckers in my hands if quite extraordinary circumstances had not prevented me—namely, the incursion of mice into my bird-room. Therefore, the Woodpeckers passed into the possession of an enthusiastic aviculturist abroad—Mr. Darviot, of Beaune, in France. This gentleman informed me some time after: 'The Striped Woodpeckers are in good health, and have already become quite tame. In my bird-room more than 300 different kinds of birds live together, towards which the Woodpeckers show themselves neither unsociable nor spiteful. As soon as I enter they fly on to my shoulders or arms, climb over my clothes, and in this way I can take a walk with them in the garden. Indeed, if they fly away from me on to a tree, they will immediately return to me when I call them. I never saw more intelligent birds than these; they even surpass the Parrots in this respect.'"

So far as I can discover, this seems to be the only

recorded instance of the importation of *C. striatus* as a cage-bird, but there is every likelihood of it being again imported.

Red-headed Woodpecker
(*Melanerpes erythrocephalus*).

Above black glossed with greenish blue; rump and upper tail-coverts white; innermost primary with the top and part of the margin of inner web white; secondaries white with shafts and concealed bases black, the outermost one with a subapical bar on inner web and the outer web black; all the tail-feathers excepting the central pair with a patch of white on inner web at base; the outer feather tipped and externally edged with white; nasal plumes brownish black; head, neck, and entire centre of chest crimson, the last mentioned narrowly edged at sides with black; remainder of under surface white, slightly yellowish on abdomen; edge of wing black. Female differs in its slightly smaller size and in its distinctly more slender and slightly longer bill. Hab., United States.

Major Bendire says of this bird ("Life Histories," pp. 108-112):—"Its breeding range is coextensive with its distribution. Birds that migrate usually return to their summer homes about the latter part of April or the beginning of May, and leave for the south again about the first of October. Their movements are very uncertain at all times, and are evidently regulated largely by the food supply; even on their breeding grounds, where they may be common one year, not a single pair may be found the next. Its favourite resorts in summer are the borders of woods, fringes of timber along streams, solitary trees in fields and pastures, shade trees along country woods, and on the treeless prairies of some of our Western States it contents itself with telegraph poles, fence posts, etc. In the South, newly-cleared fields in which a number of dead, girdled trees still remain standing are much resorted to, and in such localities these birds are very abundant at almost all seasons, but especially in winter.

"In summer the food of the Red-headed Woodpecker consists to a considerable extent of insects of different kinds, such as grasshoppers, ants, beetles, and flies, many of which are caught on the wing, and of such larvæ as may be hidden under the bark of trees, or in rotten wood; but it rarely digs out those of the wood-boring beetles, which are found in more solid trees. At this season it also feeds largely on fruits and berries, such as cherries, apples, pears, figs, peaches, and grapes, as well as on blackberries, raspberries, mulberries, poke and elder berries, green peas, and Indian corn in the milk; and last, but not least, on young birds and eggs.* In the late fall and winter its diet is more largely vegetable, one of its staples being beech-nuts; the berries of the sour gum, dogwood, and palmetto are also largely eaten; acorns, Indian corn, and small grains are likewise used, and it is well known that these birds also store away supplies, consisting both of insects and vegetable matter, for winter use."

"Its flight, like that of all Woodpeckers, is undulating and surging, and the bird looks especially graceful and pleasing on the wing. It is an adept flycatcher, and its vision is exceedingly sharp. A considerable portion of its food is picked up on the ground. I have seen one drop down from his perch on some dead limb, fully 20 ft. overhead, pick up a small beetle out of the grass, fly back to its perch to eat it, and repeat the same performance as soon as another was espied. I have also seen them cling to the side of a tree or fence post, perfectly motionless, for fifteen minutes at a time."

"Like most Woodpeckers, the Red-headed is rather noisy during the nesting season, continually frolicking and playing hide and seek with its mate, and when not so engaged, amusing itself by drumming on some resonant dead limb, or on the roof and sides of houses, barns, etc. It is a rather suspicious bird, but where not molested it will occasionally nest in close proximity to houses. Its ordinary call note is a loud "tchur-tchur"; when chasing each other a shrill note like "chärr-chärr" is frequently uttered, and alarm is expressed by a harsh rattling note, as well as by one which, according to Mr. Otto Widmann, is indistinguishable from the note of the Tree-frog (*Hyla arborea*). He tells me that both bird and frog sometimes answer each other. I consider this species rather quarrelsome and domineering, both toward its own kind and with other birds, and see little in its general character to commend. From an economic view, it appears to me certainly to do fully as much, if not more, harm than good, and I consider it less worthy of protection than any of our Woodpeckers, the Yellow-breasted Sapsucker not excepted.

"In the northern parts of its range nidification begins usually during the last week in May or the first week in June. Some of its nesting sites are exceedingly neat pieces of work; the edges of the entrance hole are beautifully bevelled off, and the inside is as smooth as if finished with a fine rasp. The entrance is about 1¾ inches in diameter, and the inner cavity varies from 8 to 24 inches in depth; the eggs are deposited on a layer of fine chips. It usually nests in the dead tops or limbs of deciduous trees, or in old stumps of oak, ash, butternut, maple, elm, sycamore, cottonwood, willow, and other species, more rarely in coniferous and fruit trees, at heights varying from 8 to 80 feet from the ground, and also not infrequently in natural cavities. On the treeless prairies it has to resort mainly to telegraph poles and fence posts, and here it also nests under the roofs of houses or in any dark corner it can find.

"Incubation lasts about two weeks, and both sexes assist in this labour, as well as in the preparation of the nesting cavity; an egg is laid daily, and incubation sometimes commences before the set is completed. The young of this species are fed in the ordinary way, at any rate after they are half-grown, the parents bringing their food in their bills. The number of eggs to a set varies from four to seven, sets of five being most frequently found, while occasionally as many as eight eggs have been taken from a nest. Mr. R. C. McGregor records taking a set of ten eggs of the Red-head, varying in size from ordinary down to that of the Song Sparrow. Incubation varied from fresh in the smallest egg to advanced in the larger; the nest was in the end of a rotten limb of a large willow, about 20 ft. from the ground. Locality, Crow Creek, Weld County, Colorado, May, 1887. Like the eggs of all our Woodpeckers, they are pure china white in colour; the shell is fine-grained and rather glossy, and when fresh they are quite translucent; they are mostly short ovate in shape, and show but little variation in this respect.

"The average measurement of sixty eggs in the United States National Museum collection is 25.12 by 19.25 millimetres, or about 0.99 by 0.76 inch."

An example of the Red-headed Woodpecker reached the London Zoological Gardens in April, 1884, and a second was exhibited at the show of the "Ornis" Society in 1890, and subsequently arrived at the Berlin

* Major Bendire records in full various instances of the cannibalistic habits of this Woodpecker, but they would occupy too much space for insertion here.

Zoological Gardens. I am afraid it is not very likely to come into private hands in future, on account of the strictness of the United States' protective laws.

WHITE-HEADED WOODPECKER (*Melanerpes candidus*).

Above brownish-black; six central tail-feathers with the basal half white barred towards distal extremity with black; the two outer feathers with their inner webs white barred with black; head, sides, and front of neck and under surface of body white; a lemon-yellow nuchal band; a black stripe on ear-coverts running into the black on hind neck; middle of chest sometimes tinged with yellow. Female differs in having a white instead of yellow nuchal band and in her shorter bill, less slender towards the tip. Hab., Southern and Eastern Brazil northward to Bahia, Bolivia, Paraguay, the Argentine Republic, and southward to Lower Uruguay. (Hargitt.)

All that Hudson tells us respecting this species ("Argentine Ornithology," Vol. II., p. 25) is:—"White speaks of this species as follows:—'These noisy birds, abundant in various parts of Misiones, as well as in the rest of the north of the Republic, go about in flocks of eight or ten, and settle on the same tree, which they proceed to ascend very comically in a spiral or corkscrew fashion, each head touching the preceding tail. They are not seen in dense forests, but only out in the open, on some old, usually dead, tree, and I think I observed them as far south as the sierras of Cordoba.'"

Mr. J. Graham Kerr, writing on the Avifauna of the Lower Pilcomayo (*The Ibis*, 1892, p. 135), says of this species: "Very uncommon. The stomachs of two individuals examined contained only honey." This seems strange food for a Woodpecker.

On the Gran Chaco, Mr. Kerr observed this species in October and November "Singly or in small parties of three or four," (*The Ibis*, 1901, p. 228.)

All that Burmeister tells us about the wild life is that it lives alone in the dense primeval forest, and is only seen in pairs at the breeding season, and this does not agree with what White and Graham Kerr say, so that we learn nothing by it. The London Zoological Gardens received a specimen in exchange in 1871, and there is not the least reason why it should not be sent home in consignments of birds from Argentina.

BANDED WOODPECKER (*Melanerpes tricolor*).*

Above black barred with white, the flights, excepting the distal half at least of the primaries, spotted with white; central tail-feathers barred on inner web and spotted towards base of outer web with white; the outer tail-feather spotted on margin of outer web and tip of inner web; forehead sordid white, yellowish at base and on nasal plumes; centre of crown crimson, shading into orange-brown behind; nape red; outer margin of crown, face, neck, and under surface pale buffish drab, becoming orange-red on abdomen; cheeks slightly yellower; chin whiter; thighs and under tail-coverts with black V-shaped markings; under wing-coverts white, slightly barred with dusky; axillaries dull buffish white; irides hazel. Female smaller than male, with shorter bill broader at base; the crown not crimson, but buffish brown in front shading into yellowish ashy-brown behind and bounded on nape by a red diffused border. Hab., United States of Colombia and east into Venezuela. (Hargitt.)

Mr. P. R. Lowe, writing on the birds of Margarita Island, Venezuela (*The Ibis*, 1907, p. 560), says:—"Very common among the foot-hills and cactus-scrub. I shot one with its head infested with worms. It had become virtually blind—a fact due to two enormous bulging prominences on either side of the head which encroached upon the orbits."

This is all I have come across respecting the bird in its wild state, but I should imagine it would not differ greatly in its habits from other Red-bellied Woodpeckers.

An example of this pretty little species (it is not 7 inches long) was purchased by the London Zoological Society, and exhibited in the Gardens at Regent's Park in June, 1870. In his work, Dr. Russ does not mention the species, but applies the name "Banded pigmy Woodpecker" to *Picumnus cirrhatus*.

SANTA-CRUZ WOODPECKER (*Melanerpes santacruzi*).

Upper surface barred black and white, the latter tinged with buff; central tail-feathers spotted with white on inner web, the outer web striped with white at base; front of forehead red or orange, divided from the red of the crown by a dirty buffish frontal band; under surface brownish drab washed with buffish behind the chest; thighs, vent, and under tail-coverts buffish white with dull blackish bars; under wing-coverts distinctly barred with black. Female with crown creamy-white shading into greyish-brown at back, the nape only being red. Hab., San Salvador, Honduras, Guatemala, Southern and Eastern Mexico, as far north as Tampico. (Hargitt.)

This is regarded as a sub-species of the Golden-fronted Woodpecker (*M. frontalis*) of the United States. Of the latter Major Bendire says ("Life Histories," Vol. II., p. 126):—"Their food consists of insects of various kinds, such as beetles, ants, grasshoppers, also larvæ, acorns, Indian corn, and different kinds of wild berries and fruit.

"Nidification commences sometimes in the latter part of March, but usually not much before the middle of April; both sexes assist in this labour, and it takes from six to ten days to excavate a proper nesting site; both live and dead trees are used for this purpose, as well as telegraph poles and fence posts. The holes are rarely over 12 inches deep, and are situated at no great distances from the ground, mostly from 6 ft. to 25 ft. up. From four to seven eggs are laid to a set, usually five or six; these are pure white; the shell is close grained, dull looking, with little or no gloss, and varying in shape from ovate to short and rounded ovate. "Incubation lasts about fourteen days, and both sexes share this duty."

An example of the Santa-Cruz Woodpecker was brought home from Venezuela in 1906, and presented by the collector, Capt. Albert Pam, to the gardens of the Zoological Society of London.

HAIRY WOODPECKER (*Dendrocopus villosus*).

Above black; back with a broad median white stripe; wing-feathers, excepting lesser coverts, white-spotted; four central tail-feathers uniform black, the next with distal half-white, two outer feathers white with black basal spot; nasal plumes buffish white, tipped with black; a scarlet occipital band, above which runs a white stripe continued on each side of the head and forming an eyebrow-stripe; a second white stripe from base of upper mandible to side of hind neck; below pure white; a black stripe bounding the throat continued on to side of chest; under wing-coverts with one or two black spots, and a black patch on edge of wing. Female without scarlet occipital band and the white eyebrow stripes barely united.

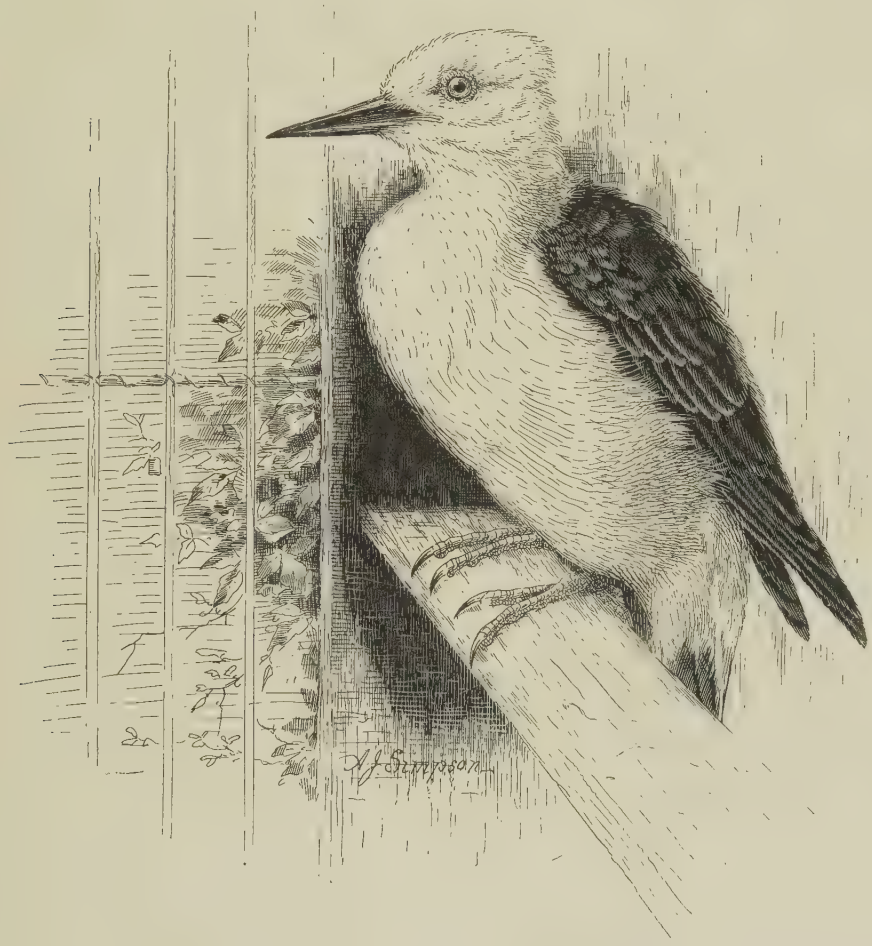
* In the "Biologia Centrali-Americana," Messrs. Salvin and Godman propose to alter the name of this species to *Melanerpes wagleri*. Mr. P. R. Lowe, however (*The Ibis*, 1907), adopts Bonaparte's name of *subelegans*.

Hab., North America, from the Atlantic to the Rocky Mountains.

Major Bendire ("Life Histories," pp. 46-50) observes: "The Hairy Woodpecker, like most of its relatives, is an exceedingly beneficial and useful bird, which rids our orchards and forests of innumerable injurious larvæ, like those of the boring beetles, *Buprestidæ*, which burrow in the wood and between the bark and trunk of trees. It never attacks a sound tree. Although commonly known as Sapsucker, this name is very inappropriate; it is not in search of sap, but of such grubs as are found only in decaying wood; nevertheless, it is exceedingly difficult to make the average farmer believe this, and in winter, when these birds are more often seen about the vicinity of dwellings and the neighbouring orchards than at other seasons of the year, many are shot under the erroneous belief that they injure the very trees they are doing their best to protect. In central New York, and undoubtedly in other sections as well, where a few decades ago one could see some of the finest apple orchards to be found anywhere, you may look in vain for them now. Nearly every tree of any size now shows abundant and unmistakable signs of decay, caused by the increase of the insects which live in them and the decrease of such birds as destroy these pests."

"The food of the Hairy Woodpecker, besides larvæ, consists of various species of small beetles, spiders, flies, ants, and in winter, when such food is scarce, to some extent of seeds and grain, and less often of nuts and acorns. I have seen it cling to fresh hides hung up to dry, picking off small particles of fat and meat, and in summer it occasionally eats a few berries of different kinds. In the fall of the year it can often be seen inspecting old fence posts and telegraph poles, probably on the look-out for cocoons, spider eggs, etc."

"Like all Woodpeckers, it is an expert climber, and moves rapidly up and around trees in short hops; it



THE WHITE-HEADED WOODPECKER.

is equally easy for it to go backward or sidewise, and it is astonishing how readily it can move in any direction. The strong feet and sharp claws enable it to hold firmly to the bark, and the stiff, spiny tail feathers also come in play while it is at work, acting as a support for the body, which is well thrown back when a blow is delivered with its powerful, chisel-like bill. Although usually rather shy, when busy in search of food one will occasionally allow itself to be very closely approached."

"Our Hairy Woodpecker is one of the earliest of this family to breed. The nesting season begins in the latter part of March, and the species is at this time one of the noisiest members of this family. The male, when not in search of food, now seems to occupy himself almost exclusively with drumming on a resonant dead limb, generally situated near the top of some tall tree. The louder the noise produced, the more satisfactory it appears to be to the performer; it seems to be a sort of love-note and call to the females, and, as far as I have been able to observe, is only indulged in by the male. In flying from one tree to another a shrill, sharp "huip, huip" is often uttered, and during the mating season both sexes are very demonstrative and utter quite a number of different notes. I believe this species remains paired through life. Nidification begins usually early in April, and it requires about a week to prepare the nesting site. Both sexes take part in this labour, and it is really wonderful how neat and smooth an excavation these birds can make with their chisel-shaped bills in a comparatively short time. The entrance hole is as round as if made with an auger, about 2 inches in diameter, and just large enough to admit the body of the bird; the edges are nicely bevelled, the inside is equally smooth, and the cavity is gradually enlarged toward the bottom. The entrance hole, which is not infrequently placed under a limb for protection from the weather, generally runs in straight through the solid wood for about 3 inches, and then downward from 10 to 18 inches, and some of the finer chips are allowed to remain on the bottom of the cavity in which the eggs are deposited. Both dead and living trees are selected for nesting sites, generally the former. When living trees are chosen, the inner core or heart of the tree is usually more or less decayed. These nesting sites are nearly always selected with such good judgment that such obstacles as hard knots are rarely encountered. Should this occur, the site is abandoned and a fresh one selected. After this is completed, the male frequently excavates another hole, or even several, in the same tree or in another close by in which to pass the night or to seek shelter, and to be close to the nest while the female is incubating; these holes are not so deep as the others. A fresh nesting site is generally selected each season, but where suitable trees are scarce the same one may be used for several years in succession, and in such a case it is usually thoroughly cleaned out and the old chips in the bottom removed and replaced by fresh ones. Beech, ash, poplar, birch, oak, sycamore, haw, and apple trees are mostly used for nesting sites."

"In the New England States and northern New York fresh eggs are usually found during the first week in May, and ordinarily only one brood is raised in a season. In the Adirondacks their holes are often found from 40 to 50 feet from the ground. The duties of incubation are divided between the sexes, and last about two weeks. The young, when first hatched, are repulsive-looking creatures, blind and naked, with enormously large heads, and ugly protuberances at the base of the bill, resembling a reptile more than a bird. They are totally helpless for some days, and cannot stand, but they soon learn to climb. They are fed by the parents by regurgitation of their food, which is the usual way in which the young of most Woodpeckers are fed when first hatched. Later, however, a few species, like the Red-headed Woodpecker and other members of this genus, feed their young in the ordinary manner, carrying the food in their bills. The young remain in the nest about three weeks. When disturbed they utter a low, purring noise, which reminds me somewhat of that made by bees when swarming, and when a little older they utter a soft 'puirr, puirr.' Even after leaving the nest, they are assiduously cared for by both parents for several weeks, until able to provide for themselves. Should the first set of eggs be taken, a second, and sometimes even a third, is laid at intervals of from ten to fourteen days, and if the nesting site has not been destroyed or the entrance hole enlarged (which can readily be avoided by sawing out a sufficiently large piece below the hole, enabling the collector to insert his hand, and replacing this again carefully after taking the eggs), they will frequently use it a second time.

"The number of eggs laid to a set varies from three to five, usually four. I have been informed that sets of six and seven have been taken, but I doubt this. They are nearly oval in shape, sometimes elliptical oval, and occasionally rounded ovate. The shell is very finely granulated, glossy, and semi-translucent when fresh, the yolk being plainly visible then; but as incubation advances it becomes more opaque. Like all Woodpeckers' eggs they are pure white and unspotted.

"The average measurement of twenty-nine specimens in the United States National Museum collection is 23.65 by 17.94 millimetres, or about 0.93 by 0.71 inch."

Russ observes that this species reaches us in Europe extremely rarely and singly in the zoological gardens. He does not specify any gardens which have possessed it, but I take it as certain that he must have had definite information, or he could hardly assert that it had ever been imported. It seems never to have arrived at the London Zoological Gardens, and now that the capture of native birds is prohibited in the United States, it can only be secured by exchange with a Government institution.

YELLOW-HEADED WOODPECKER (*Celeus flavescens*).

Above black, the back and scapulars with narrow yellow bars; rump yellow, as also the edges of some of the adjacent upper tail-coverts; wing-coverts more or less margined with yellow, the median and greater coverts barred with yellowish white; bastard wing and primary coverts, inner webs, and base of outer webs of inner primaries spotted with yellowish white; secondaries narrowly barred with the same colour on both webs; two outer large tail feathers with distal portion of inner web and dwarf feather on both webs spotted with white; head, crest, back of neck, chin, and throat buffish yellow; lores spotted with black; a large crimson patch on cheeks; fore neck and under surface generally, black; feathers of upper fore neck with yellow margins; some of those on lower fore neck and of thighs and under tail-coverts in part narrowly edged with sordid buff-whitish; sides of body barred with yellow; tibial plumes buffish yellow; under wing-coverts and axillaries lemon-yellow. Female with shorter crest; the cheeks yellow, striped with black, no crimson patch; general colouring a trifle paler. Hab., Eastern and Southern Brazil, extending north to Bahia. (Hargitt.)

Burmeister says ("Systematische Uebersicht," Vol. II., p. 231):—"The Woodpecker is unusually abundant

in all woods in which wide openings have appeared by decay. It permits the hunter to approach with ease, soon catches the eye on account of its beautiful large crest, and utters its screeching note frequently enough to arrest the traveller's attention." This is all I have discovered respecting the wild life, but it is sufficient to make one marvel that the species has been so little imported. An example was received by Miss Christiana Hagenbeck in 1877, and was sent to the Zoological Gardens of Frankfort.

Pileated or Larger Red-crested Woodpecker (*Dryotomus pileatus*).

Smoky black; edge of wing white spotted with black; flights with concealed white bases; outer webs of outer primaries with sordid white terminal spot; forehead, crown and crest, as well as nuchal feathers and moustachial stripe, crimson; a narrow white eyebrow-stripe extending backwards to occiput; lower nasal plumes and a broad stripe from nostril across face and side of neck to side of chest, white; chin and throat white; under wing-coverts and axillaries white; sides and flanks indistinctly and narrowly barred with greyish white; bill blackish, grey above, pale horn-colour beneath; feet bluish-black; irides golden yellow. Female with the cheeks wholly black; margins of frontal feathers and most of crown dark brown, the remainder black, the back of crown and the crest alone being crimson. Hab., "Formerly the whole wooded region of North America up to 63 deg. N. lat. Now rare or extirpated in the more thickly settled parts of the United States." (Hargitt.)

Major Bendire ("Life Histories," Vol. II., pp. 102-107):—"It is eminently a bird of the more extensive forest regions, and is as much at home in a semi-tropical as in a cold climate. As a rule, specimens from the northern borders of its range are considerably larger than those from the south. There appears to be a considerable difference in the habits of this bird; in some sections it is extremely shy and wary, while in others it is exactly the reverse.

"The ordinary call-note is a loud 'cäck-cäck-cäck,' several times repeated; another resembles the 'chuck-up' of the Red-shafted Flicker, only somewhat slower, louder, and clearer; others, again, remind one of the cackling of a domestic hen. One of its love notes, according to Mr. A. Nehrling, sounds like 'a-wuck, a-wuck,' and one of alarm, or anger, 'ha-hi, ha-hi.' It is very noisy during the nesting season, and indulges in a good deal of drumming at this time of year. I believe they remain mated through life, and pairs are more frequently seen than single birds.

"Its food consists of the different species of boring beetles and their larvæ infesting timbered tracts, and of ants, many of which it captures on the ground; it also feeds on wild grapes, the berries of the black gum, dogwood, pokeweed, service berries, acorns, beechnuts, and chestnuts. Considered from an economic point of view, it does far more good than harm, and only attacks decaying and fallen timber.

"Its flight is both strong and swift at times, but, as a rule, when at ease it is slow and Crow-like, rather more direct and not so undulating as that of most of our Woodpeckers, and is often protracted for long distances.

"In southern Florida the mating season commences early in March, and farther north correspondingly later. A suitable tree having been selected, generally a dead one in large and extensive woods, both birds work alternately on the nesting site. This is usually excavated in the main trunk, from 12 to 75 feet from the ground, and it takes from seven to twelve days to complete it. The entrance measures from 3 to 3½ inches in diameter, and it often goes 5 inches straight into the trunk before it is worked downward. The cavity varies from 7 to 30 inches in depth, and is gradually enlarged toward the bottom, where it is about 6 inches wide. A layer of chips is left at the bottom, on which the eggs are deposited. Occasionally the entrance hole, instead of being circular, is oval in shape, like that of the Ivory-billed Woodpecker. The inside of the cavity is quite smooth, the edges of the entrance are nicely bevelled, and, taken as a whole, it is quite an artistic piece of work. Some of the birds, presumably such as have been molested previously, are quite shy and artful, removing every trace of chips as soon as loosened and dropping them in different places, at some distance from the nesting site, so as not to betray its location by the accumulation of chips at the base of the tree, and occasionally they show, if possible, still more intelligence. Dr. William L. Ralph tells me that in the spring of 1892 he found a nest of this species in Putnam County, Florida, where the bird is quite common, excavated in a dead cypress in swampy woods, which was comparatively easy to get at. He found this in the second week in April, about the time nidification is at its height there. On rapping on the trunk of the tree the bird, which was at home, stuck his head out of the hole and dropped some chips, naturally causing the Doctor to believe that the nesting site was still unfinished. The same performance was repeated on several subsequent visits, and finally he concluded to examine the nest anyhow, when he found nearly full-grown young. This pair of birds must have had eggs at the time he first discovered the nest, and the chips were simply thrown out as a ruse to deceive him.

"The trees most often used for nesting sites are cypress, gum, pine, fig, tamarisk, oak, sycamore, elm, birch and cottonwood, and in southern Florida the trunk of the cabbage palmetto also furnishes suitable nesting sites. Besides the customary layer of chips found in the bottom of the hole, one of the nesting sites examined by Dr. Ralph contained fully a pint of clean sand."

"From three to five eggs are usually laid to a set, but I have seen it stated that the Pileated Woodpecker often laid six, and that a nest found near Farmville, Virginia, contained eight. An egg is deposited daily, and incubation begins occasionally before the set is completed, and lasts about eighteen days, both sexes assisting in this duty, as well as in caring for the young. Like all Woodpeckers, the Pileated are very devoted parents, and the young follow them for some weeks after leaving the nest, until fully capable of caring for themselves. Only one brood is raised in a season. The eggs of the Pileated Woodpecker are pure china white in colour, mostly ovate in shape; the shell is exceedingly fine-grained and very glossy, as if enamelled; they are not as pointed as those of the Ivory-billed, and average smaller.

"The average measurements of twenty-nine specimens in the United States National Museum collection, mostly from Florida, are 32.44 by 24.08 millimetres, or about 1.28 by 0.95 inch."

Russ says that this species reaches us very rarely, and indeed only in zoological gardens; again, he specifies no particular gardens which have possessed it. In future they will probably have to acquire it by exchange with the New York Zoological Park or some other big institution in the States.

Pigmy Barred Woodpecker (*Picumnus cirrhatus*).

Above brown, with ill-defined buff-brownish bars; wing-coverts tipped with buff-brownish or whity-brown; flights more or less edged internally with dull

white, the secondaries edged externally also; upper tail-coverts white, with dusky bars; central tail-feathers with white inner webs, outer feathers obliquely banded with white, as usual; nasal plumes buff, with black tips; top of head, including eyebrow, and nape black, the feathers of forehead and crown with scarlet tips; the remainder spotted with white; hind-neck whitey-brown, with dusky bars; ear-coverts buffish-brown, barred with black; sides of face and neck and under surface dull white, buffish on flanks and thighs; under wing-coverts buffish-white, a dusky spot near base of primaries; bill horn-black, lower mandible paler at base; feet leaden-grey; irides greyish-brown. Female differs in having the whole top of head white-spotted, the scarlet tips to the feathers being absent. Hab., Provinces of Bahia and Rio Janeiro, and westward into Paraguay.

Burmeister ("Systematische Uebersicht," II., p. 245) says: "This elegant little bird inhabits the forests of the coastal region, and is not rare therein; its mode of life is entirely that of the Goldcrests.* I could not distinguish its voice from that bird. Towards autumn the birds unite into little companies; in the summer one only sees them in pairs. They then nest in holes in trees, sometimes quite near to settlements, as Schomburgk observed." I have discovered nothing more respecting the wild life of this tiny Woodpecker. It was imported in 1860, and reached the Zoological Gardens of Amsterdam, but appears not to have come to hand since that date.

COLIES (*Coliidæ*).

I shall now proceed to the Colies, or Mouse-birds, a group of interesting little acrobats having all the toes of the foot directed forwards. In the old days, before their anatomy had been studied, they were supposed to be Finches, to some of which the general form of the bill and the crested character of the head give them a certain resemblance. They are, however, generally regarded as related to the Woodpeckers, Kingfishers, and Hornbills. Mr. Pycraft, however, believes them to come nearer to the Swifts. They are somewhat dull-coloured, fruit-eating birds, ranging from Abyssinia southwards to the Cape of Good Hope. They build more or less cup-shaped or open nests, in which, again, they remind one of some of the *Fringillidæ*, and the eggs, though white, or nearly so, do not possess the highly-polished character of those of Woodpeckers or Kingfishers, but are dull and chalky, like those of the Swifts, which are also dead-white; they, however, are shorter, and usually flecked and scrawled with rust-red.

Striated or Speckled Coly (*Colius striatus*).

Above ashy-brownish, paler on head, darker on rump, indistinctly vermiculated, the neck and mantle being traversed by a few transverse brown lines; wings and tail not vermiculated; primaries brown externally towards the base; central tail-feathers ashy, with brown shafts; the remainder ashy and white-edged externally, with reddish-brown shafts, and with somewhat rufescent inner webs; feathers of crown elongated into a long, loose crest, which is depressed when food is taken; the head more ashy than the back, pale ashy-brown on sides of face and ear-coverts; forehead and lores dull reddish; throat, breast, and sides of body ashy-brown, with well-defined darker vermiculations; lower breast, flanks, under wing and tail-coverts ochreous-buff, rufescent on under tail-coverts; quill lining and tail below chestnut-buff; bill with upper mandible black, the lower bluish-brown; feet purplish-brown; irides dark brown; orbital skin black.* Female with the crown of the head paler and even more ashy than in the male; the beak longer and broader, with more curved upper mandible. Hab., South Africa, from the Cape to the Zambesi.

Messrs. Stark and Sclater ("Birds of South Africa," Vol. III., pp. 96, 97) observe: "The habits of all Mouse-birds are very similar. They are to be seen almost invariably in small parties of from six to twelve individuals; even when the females are incubating, the males keep together. They affect thick bush, where they climb like Tits, crawling about and placing themselves in all sorts of different attitudes; in doing this, the whole of the tarsus is often applied to the branch, acting like the sole of a foot, and is often much rubbed in consequence. When alarmed, they fly off one after the other, with short, direct flight, compared by Le Vaillant to an arrow shot from a bow. The Mouse-bird feeds entirely on fruit, and is generally to be seen in a garden as soon as figs and loquats, of which it is specially fond, become ripe. During the fruit season they do a good deal of damage in the western portion of the Colony. At night-time they are stated by Ayres to roost head downwards in small companies. Shelley found a nest at Pinetown, in Natal, on March 15th, Stark at the same place on Dec. 18th. In the latter case the nest, which was placed at the top of an orange tree, about 15 feet above the ground, was an open one, resting on and surrounded by twigs of the bush; it was rather small, and was loosely built of pieces of bark three or four inches long, of the Kaffir tea plant, of a flowering weed, and small twigs; it was lined with *green* narrow fronds and leaves. There were three quite fresh eggs in the nest, and there were enlarged eggs in the ovary of the female which was secured. The clutch is therefore more than three, probably five to seven. The eggs are rough, and were probably originally chalky-white, but are a good deal stained with dirt. They are ovals, somewhat pointed at the acute end, and measure on an average 0.92 × 0.62.

"Mr. Ayres was the first to notice this bird's habit of lining the nest with fresh leaves, and suggested that perhaps dampness was necessary for incubation."

Dr. F. Rendall (*The Ibis*, 1896, p. 174) says that the stomach of a male which he shot contained oval seeds. May not these have been the kernels of some fruit?

The late Mr. J. Abrahams first imported several pairs of this species in 1865, but the London Zoological Gardens appear not to have acquired the species until 1885, when they purchased a single example.

Mr. Graham Renshaw (*The Avicultural Magazine*, Second Series, Vol. I., pp. 174-177) gives an account of a specimen in his possession. He tells us that when eating a grape it shifted it from the beak to the foot, which grasped it in a singular monkey-like manner while the bird proceeded solemnly to make a meal. He fed it upon ants' eggs, mealworms, grapes, apples, and pears, and on one occasion he found it dragging about the dead and partly devoured body of an Avadavat. He says that the bird used to sleep lying prone on a convenient ledge or shelf, looking as if dead, or at the last gasp. Its note was a weak chirp, but it squarked rapidly when much alarmed.

* How this can be, when it nests in holes in trees, I will not pretend to understand; possibly its actions may to some extent resemble those of *Regulus*, but I should have thought they would more nearly approach those of *Acredula*.

* Some examples have the forehead and chin blackened, but whether from fraying of the feathers or staining with fruit is undecided.

Black-necked Coly (*Colius nigricollis*).

Differs from the preceding species in having a white mark at the base of the culmen; the forehead and throat black and the feet pale yellowish. Hab., Congo Region, extending into the Niam-Niam country. (Sharpe.)

I have found no account of the wild life of typical *C. nigricollis*, but of its race, *C. nigriscapalis*, Mr. G. L. Bates, speaking of the breeding seasons of birds in Southern Kamerun, observes (*The Ibis*, 1908, p. 564):—"Many nests of *Colius nigriscapalis* with eggs or young were found, besides the birds killed, of which the breeding organs were examined. The greater number of the nests with eggs, and also of the breeding birds, were obtained in the two rainy seasons; and the greatest number of all in the rainiest time, October and November. Yet not all were found at those times: breeding birds were killed in December and in February, and a nestling was found in August—all dry months."

In 1882 Miss Hagenbeck sent a specimen of this species to the late Dr. Russ for identification, and in 1887 an example reached the London Zoological Gardens.

White-eared Coly (*Colius leucotis*).

Differs from *C. striatus* in its ashy-white ear-coverts and hind cheeks; the back of neck and mantle broadly barred with dusky brown; upper mandible black, with bluish white culmen; lower mandible fleshy whitish, blackish at base; feet bright vermilion with the soles tinged with grey; irides pearl-white; naked orbital region bluish. Female not differentiated. Hab., "Abyssinia and Bogos-land, south to Shoa." (Sharpe.)

Von Heuglin ("Ornithologie Nord-Ost Africas," Vol. I., p. 711) says:—"As concerns its manner of life, it herein resembles much the Senegal Mouse-bird, but confines itself even more than the latter to the densest scrub of thorn-trees and vines, and to the forest region, than to large trees and human settlements. Its vertical distribution lies between 1,000 and 11,000 feet above sea-level. The closely crowded families rove from bush to bush, especially along the banks of torrents and waterfalls, and wherever by any possibility in matted thickets, where the birds have no need to wander far. Also they are fond of frequenting old brickwork and rubbish heaps, where their favourite food, the *Schebti*-plant (Phitolacca habessinica, the Amhuran *Endot*), grows; at other times these creatures feed upon fruits of Leguminosæ, *Capparis, Zizyphus, Cordia;* we also saw them upon sycamore, cucurbitaceæ and cissus-berries. Their plumage is very rough and dry, so that during showers it absorbs much water and renders the birds incapable of flight. At the time when figs are ripe the face and throat are often quite covered with the clogged juice of these fruits."

Dr. S. L. Hinde (*The Ibis*, 1898, p. 583) says that this species is "common in flocks all over the country from Mombasa to Kikuyu, except in the middle of the bare plains."

Mr. Alfred E. Pease says (*The Ibis*, 1901, p. 670):—"The White-eared Coly was very common and invariably to be seen in large companies of individuals flying one after another from bush to bush, the last leaving with apparent reluctance." This was in Southern Abyssinia.

Mr. A. L. Butler (*The Ibis*, 1905, p. 356) observes:—"Widely distributed. I have shot it on the Setit River, on the Bahr-el-Ghazal, and at intermediate points on the Blue and White Niles. I do not remember to have seen it frequenting gardens and date-palm groves like the blue-naped species."

Four examples of this bird reached the Berlin Zoological Gardens in 1895, and the keeper, Meusel, sent Dr. Russ some interesting notes respecting their behaviour in captivity; those who wish to read them should refer to Vol. II. of his "Fremdländischen Stubenvögel," pp. 632, 633.

Red-cheeked Coly (*Colius erythromelon*).

Above olivaceous grey, washed with buff on back and rump; wings rather greener; tail green with dusky inner webs and black shafts; crest of head slightly buffish, forehead reddish buff; ear-coverts and cheeks green, the latter buffish in front; throat and under surface sandy buff, sides of body olivaceous grey; flanks and under tail-coverts green; under wing-coverts reddish buff, the quill-lining chestnut; bill black at tip, crimson at base; feet rose-red; irides pale grey; orbital naked skin crimson. Female smaller, with the colouring slightly paler and the beak smaller. Hab., South Africa, to Angola on the west, and the Zambesi and Mozambique on the east. (Sharpe.)

Messrs. Stark and Sclater ("Birds of South Africa." Vol. III., p. 100) remark that "the Red-faced Mouse-bird does not differ from the other Mouse-birds in habits. It is gregarious in flocks of from six to twelve individuals; it feeds on berries and fruits; its flight is rapid, straight, and short, and it climbs and crawls about amid thick bush; its cry is shrill, and somewhat resembles its native Zulu name, according to the Woodwards. The latter authors also describe a nest found in the fork of a thorn tree near the Umhlatusi River, in Zululand. It was composed of wild cotton in seed, an inch thick, on a platform of thorny twigs. The eggs, three in number, were white, freckled and streaked with red.

"Holub found that this bird did well in captivity in a large cage along with other birds, and fed best on oranges."

Mr. B. Alexander (*The Ibis*, 1900, pp. 105, 106) says: "By no means common, and first observed on November 10 near Chicowa. In habits they resemble *C. striatus*, travelling about in small parties, and keeping chiefly to the thickest portions of well-leaved trees, away from the heat, which they seem to feel very much, becoming active only in the early morning and evening. The cry, generally uttered on the wing and when in flock, is a series of notes rapidly repeated, and in sound far-reaching and mellow." "This bird has a strong and straight flight, and it seldom, if ever, alights on the ground."

Mr. R. H. Joy (*The Ibis*, 1901, p. 24), speaking of the Cuckoo, *Coccystes serratus*, observes: "In December, 1897, I saw one of these birds leave the nest of a Coly (*Colius erythromelon*). The nest contained three eggs of the host (white, with a few pink scratches), together with one egg of the Cuckoo (pure white)."

Messrs. Seimund and Grant (*The Ibis*, 1904, p. 27) say that an old male which they obtained had the soft parts coloured as follows:—"Iris yellow; bare skin round the eye and lores carmine; base of bill and feet crimson; tip of both mandibles black." A young male had the "iris 'hazel,' the bare skin round the eye and lores yellow, with a slight tinge of red; gape yellow; base of bill greenish, the tip bluish slate-coloured; feet dull crimson.

"This we called the Mountain Coly, as it kept closely to the kopjes, occasionally visiting the orchards to feed on figs."

The London Zoological Society acquired two speci-

mens of this Coly in 1884, and the same year Miss Hagenbeck exhibited five examples at the "Ornis" Exhibition in Hamburg.

Blue-naped Coly (*Colius macrurus*).

Much like the preceding, but a good deal paler, and with a tuft of sky-blue feathers on each side of the nape; upper mandible red, with base and tip horn-blackish; lower mandible black; feet rosy-crimson, soles "bluish-yellow!"; iris and orbital ring crimson. (Heuglin.) Female not differentiated. Hab., "N.E. Africa, across to Senegambia and Gaboon." (Sharpe.)

According to Von Heuglin, this species "does not wander, and lives in flocks of five-ten individuals. One meets with these birds not rarely in the steppes and forest region, preferably in the neighbourhood of brooks and torrent-beds; they visit gardens in numbers, even in the middle of villages and towns. They are of a lively and restless nature, not at all shy, and they affect the tops of tall trees, such as sycamores, rather than shrubs of nabag, acacias, etc. The Mouse-bird seeks certain favourite spots almost daily, even when these are far distant from each other. According to Brehm, its food consists chiefly of insects; we have learnt to recognise him as a robber of grapes, bananas, figs, anones, and pomegranates; he, however, also partakes of date-plums, fruits of the Cordiæ and Cucurbitaceæ, and is satisfied with all possible seeds; if these are lacking, he may perhaps also feed upon buds, and even insects. With astounding dexterity these birds slip through the most impenetrable thorny thickets, and suspend themselves on the branches, and even on fruit bushes. If one starts off crying and chirping from the top of a tree, the whole flock follows him. The flight is direct, short, fluttering, and gliding, also remarkably Woodpecker-like in its pauses; at the same time, the long, narrow tail is not expanded, and is usually carried quite horizontally; during its passage the bird utters an unpleasing, somewhat flute-like whistle, which may be expressed in writing something like *dlū-dla-dlū-ola*. We found the nest in the rainy season up to the end of September on pomegranate shrubs and vine-branches in the gardens of Khartoum. It consists of dry grass, tree-fibre, roots and twigs; is small, flat, and lightly constructed. It contains two to three fairly fine-shelled, mostly bluntly-oval eggs, with a white ground-colour, showing rosy from translucence, and marked with a few fairly sharply-defined, rust-coloured spots, streaks, and flourishes. Their length measures 8‴—9‴. by 6½‴—7‴ diameter." ("Ornithologie Nord-Ost Africas." Vol. I., pp. 713, 714.)

Mr. H. F. Witherby (*The Ibis*, 1901, p. 264) says: "Colies of this species were everywhere common. They kept to the thickest trees, and were always in company, four or five being generally together. When alarmed, these birds hide themselves in the densest part of a tree, through which they climb and creep. Arrived at the far side of it, they rush out, uttering a piping note, which denotes but the faintest suggestion of alarm. Much the same note, but softer and more plaintive, and uttered in a less hurried way, forms the call. The flight is fairly straight, and rather heavy. On April 23rd I saw one of these birds collecting stuff in its bill, as though for building, but no nest was to be found, and the birds seem to have finished breeding, and to be in family parties.

"Adult: Iris red; bill, upper mandible pinkish-red, with black tip; lower mandible black; legs and feet purple: orbits bare, lake-red."

On the other hand, Mr. A. E. Pease (*t.c.*, p. 670) says: "Iris brown; naked skin round eye dark red; bill red at base, black at the tip; legs dull red." He also says "it is a stronger bird on the wing than *C. leucotis*. It would almost seem that the soft parts in this species must vary locally, like those of the different races of the Passerine Dove; yet, if so, there must be two types on the White Nile, for in *The Ibis* for 1902, p. 428, Mr. R. McD. Hawker says: "Iris hazel; bill red, black at tip; legs and feet purplish-red," or have Messrs. Witherby and Hawker different conceptions of colour?

In his paper on the "Ornithology of the Egyptian Soudan" (*The Ibis*, 1905, p. 356), Mr. A. L. Butler says:—"The Blue-naped Coly is common and evenly distributed along both the White and Blue Niles, but does not seem to range much further north than Khartoum. In the gardens of that town it is often seen, especially when the dates, to which it is very partial, are ripe, and it breeds in the lime-trees in the early spring. Except in the nesting season, it is always met with in flocks of from ten to twenty individuals. These parties feed in the closest company, and the birds all take flight from a tree simultaneously. Their flight is straight and rapid, and on the wing they utter a shrill little trilling whistle.

"In captivity these Colies become very tame, and thrive well on a diet of dates and figs."

Mr. F. J. Jackson, "On Birds Collected during a Journey to the Ruwenzori Range" (*The Ibis*, 1906, p. 522), gives a slightly different description of the soft parts:—"Iris crimson; bill coral, tip and lower mandible black; bare patch round eye plum-coloured; feet heliotrope-coloured." He says:—"We found the nest of this bird. It was built on the top of the old nest of a Weaver-Finch. The eggs were four in number."

In a later paper by Mr. A. L. Butler (*The Ibis*, 1908, pp. 243-244) we read:—"On October 13th, 1905, and for a few days afterwards, I saw a pied example of this Coly, with the back, wings, and tail mostly white, among a flock in Khartoum. Blue-naped Colies were plentiful in the gardens at Suakin in April, 1906. They were constantly met with along our line of march in the Bahr-el-Ghazal Province. These Colies are at present quite abundant in Khartoum, their numbers having greatly increased with the growth of trees and gardens.

"In captivity they are most charming birds. Their attitudes are extraordinary, and they often suspend themselves under their perches like *Loriculi*, always crowding together into as compact a bunch as possible. One characteristic position is to let themselves down behind the twig on which they are perched until only their bills and eyes appear over the top of it. A row of them will maintain this position for an hour at a time, looking precisely as if they were drawing themselves up to the chin on a horizontal bar."

This charming Coly has hitherto reached the Zoological Gardens of Amsterdam and Copenhagen; it would probably be one of the easiest to import, and will doubtless, ere very long, be tolerably familiar to aviculturists.

Chestnut-backed Coly (*Colius castanonotus*).

Above deep chestnut or chocolate-brown; inner secondaries slightly washed with grey; lower back, rump, and upper tail-coverts distinctly redder; tail washed with grey-green; forehead broadly black with white dots; feathers below eye, front of cheeks and chin black, with white dots; ear-coverts, back of cheeks and throat pinkish ash; under surface generally pale buff, deeper on under tail-coverts; edge of wing ashy; lining of flights chestnut; feet pale red. Female apparently larger, with longer tail, and more arched maxilla. Hab., Gaboon to Angola.

According to Monteiro (Sharpe and Layard, "Birds of South Africa," p. 554), this species "feeds on wild fruits, principally on that of a wild fig-tree very abundant all over the country, and called *Macuzo*; flies slowly, generally in threes, and fours together, uttering a disagreeable note."

Three examples arrived at the London Zoological Gardens in 1876.

CAPE COLY (*Colius colius*).*

Above darkish lilacine grey with a white dorsal line to the rump, bounded on both sides by a broad black band, and succeeded on lower rump by a maroon patch; flights brown, grey externally; upper tail-coverts and tail grey, the outer feathers with white edges; sides of head and throat lilacine grey, shading into pinkish on breast and sides; abdomen and under tail-coverts buff; lesser and median under wing-coverts white, greater coverts black; bill bluish white or pale blue at base; tip of maxilla black, of mandible yellowish-brown; feet coral-red, claws black; irides and small orbital ring black. Female larger than male, with longer and more tapering beak.

According to Messrs. Stark and Sclater ("Birds of South Africa," Vol. III., pp. 98, 99), this bird closely resembles *C. striatus* in habits. "It is gregarious; it roosts in companies congregated into a ball; it loves thick bush, where it will creep about like a Parrot, using both bill and claws, and often hanging with its head downwards without inconvenience. It is essentially a fruit-eater, though stated by Anderson not to despise insects and young shoots of plants when its regular food is scarce. Its note is a harsh chatter, syllabled by Le Vaillant as 'qui ve, qui ve,' to which it gives vent when flying from one tree to another. Its flesh is very palatable. Nests of this species have been taken by Anderson on September 26, October 16, and December 29; they were usually built in a bush, and were composed externally of grass and twigs, lined internally with softer grass. In each case there were three eggs. No mention is made of a lining of fresh green leaves, such as is found in that of the Speckled Mouse-bird.

"The eggs are dirty white and chalky, like those of the preceding species, and measure 0.90×0.65."

This is a frequently imported species, which first arrived at the London Zoological Gardens in 1885.

KINGFISHERS (*Alcedinidæ*).

These beautiful birds have been regarded by some ornithologists as related to the Hornbills, to which externally they offer very little resemblance. Professor Newton was of opinion that they were probably more nearly related to the Jacamar, Motmots, Bee-eaters, and perhaps some other families, and it is evident that Dr. Sharpe considered them (in his catalogue) as nearly related to the Motmots, Todies, and Colies, since he associated the four groups in one sub-order—*Halcyones*.

Dr. Sharpe, in his beautiful monograph of the Kingfishers, divided these birds into two sub-families—*Alcedininæ*, in which the bill is long and slender, compressed, and perceptibly keeled. Habits mainly piscivorous; and *Daceloninæ*, in which the bill is more or less depressed; the culmen rounded or flattened, sometimes even grooved. Habits mainly insectivorous or reptilivorous. Of these two it is obvious that the latter would be more easy to keep in captivity; nevertheless even our common European Kingfisher has been kept with varying success by different aviculturists. The difficulty of providing a sufficient quantity of small living fish to keep the birds in vigorous health and the question of space for needful exercise are the two chief objections to keeping piscivorous species; an extensive aviary enclosing a fair amount of water is what is needed.

Dr. Russ, very improperly, I think, excludes the Kingfishers from his work.

LAUGHING KINGFISHER (*Dacelo gigas*).

Upper back white, barred with dusky brown; scapularies and mantle and wing-coverts brown, but the scapularies white at base, the median coverts tipped with greenish or silvery white; lower back and rump greenish-blue, dusky at base of feathers; upper tail coverts and tail rufous, barred with black; all excepting the central tail-feathers increasingly tipped with white; bastard-wing, primary-coverts, and flights blackish, externally washed with dark green, primaries white at base; crown brown mottled on forehead with rufous, crest-feathers with white margins; a broad white eyebrow-stripe extending to the nape, which it encircles; sides and back of neck also white, forming a wide collar separated from the stripe on the nape by a dark brown band continuous with the ear-coverts, which are of that colour; lores blackish; cheeks and under surface dull white, the edges of the feathers, especially on flanks and under wing and tail coverts with dusky edges. Female with "more rufous on crown and ear-coverts; lower back, rump and upper tail-coverts rufous, barred with black." (Sharpe.) She has also a much shorter bill, broader at two-thirds from the base.* Hab., Australia.

Gould says ("Handbook to the Birds of Australia," Vol. I., pp. 122, 123, 124):—"The *Dacelo gigas* is a bird with which every resident and traveller in New South Wales is more or less familiar, for, independently of its large size, its voice is so extraordinary as to be unlike that of any other bird. In its disposition it is by no means shy, and when any new objects are presented to its notice, such as a party traversing the bush, or pitching their tents in the vicinity of its retreat, it becomes very prying and inquisitive, often perching on the dead branch of some neighbouring tree, and watching with curiosity the kindling of the fire and the preparation of the meal. Its presence, however, is seldom detected until it emits its extraordinary gurgling, laughing note, which generally calls forth some exclamation according with the temper of the hearer, such as "There is our old friend the Laughing Jackass," or an epithet of a less friendly character. So remarkable are the sounds emitted by the bird that they have been noted by nearly every writer on New South Wales and its productions."

"It frequents every variety of situation; the luxuriant bushes stretching along the coast, the more thinly-timbered forest, the belts of trees studding the parched plains, and the brushes of the higher ranges being alike favoured with its presence; over all these localities it is rather thinly dispersed, being nowhere very numerous.

"Its food, which is of a mixed character, consists exclusively of animal substances; reptiles, insects, and crabs, however, appear to be its favourite diet: it devours lizards with avidity, and it is not an unfrequent sight to see it bearing off a snake in its bill to be eaten at leisure; it also preys on small mammalia. I recollect shooting a Great Brown Kingfisher in South Australia,

* I must say I much prefer the name *Colius capensis* for this species; the repetition of the generic name, indicating the laziness of Gmelin in not inventing a new name for the genus, is irritating; but what can one do?

* When examining the Museum series for my book, "How to Sex Cage-birds," I failed to notice the colour differences described by Dr. Sharpe, but no doubt they exist, though Gould says the sexes are "scarcely distinguishable from each other."

in order to secure a fine rat I saw hanging from its bill, and which proved to be a rare species. The *Dacelo gigas* breeds during the months of August and September, generally selects a hole in a large gum tree for the purpose, and deposits its beautiful pearl-white eggs, which are 1in. and 9 lines long by 1in. and 5 lines broad, on the decomposed wood at the bottom. When the young are hatched it defends its breeding-place with great courage and daring, darting down upon any intruder who may attempt to ascend the tree."

"It bears confinement remarkably well, and is one of the most amusing birds for the aviary with which I am acquainted. Many examples have been brought alive to England, and several are now living in the Gardens of the Zoological Society of London."

My next-door neighbour brought home a pinioned example of this by no means beautiful Kingfisher, and kept it in a dog-kennel at the end of his garden. I repeatedly heard its horrible notes, which struck me as remarkably like the gobbling of a turkey, and not even remotely the laughter of a human being; but possibly in its native home the wide spaces, tall trees, and other surroundings may alter the tone of the cry. On more than one occasion I heard the death-screams of freshly-flown Thrushes and other unsuspecting birds proceeding from the kennel. The old scoundrel used to watch from the entrance until some unwary young bird came to feed upon the scraps put out for the Kingfisher, and then suddenly spring upon it and literally tear it to pieces for his own delectation. I should therefore quite agree with Gould, that, if one took pleasure in the sufferings of the weak, this would indeed be "one of the most amusing birds in the aviary."

This bird first reached our London Zoological Gardens in 1856, when three specimens were purchased, since which time probably between seventy and eighty specimens have been exhibited there alone; how many have been to the fore in the zoological gardens of the world, and the parks, pleasure-grounds, and gardens of private aviculturists, it would be impossible even to guess; now, however, the bird is rather strictly preserved.

Leach's Laughing Kingfisher (*Dacelo leachii*).

Above brown, the feathers with paler margins; lower back, rump, and upper tail-coverts silvery-blue; upper tail-coverts and tail-feathers dark blue with black shafts and increasingly white tips, the outer feathers more or less spotted marginally with white towards the tips, and the outermost feather barred with white on inner, and mottled with white on outer, web; median wing-coverts edged with silvery greenish-blue, the inner ones almost wholly of that colour; greater coverts slightly edged with greenish; bastard wing, primary-coverts and flights deep blue externally, black at tips and internally; a large white patch at base of primaries; crown of head white streaked with brown, as also the sides of the head; a broad white collar round back of neck; under-surface dull white vermiculated with brown; under wing-coverts and axillaries with darker but less numerous vermiculations; upper mandible brownish-black, lower mandible pale buff; feet olive; irides dark brown. Female differs in the cinnamon-rufous colour of the tail, which is barred with dark blue and tipped with white. Hab., Eastern Australia and North Australia from Cape York to Port Darwin and Port Essington. (Sharpe.)

Gould observes ("Handbook," Vol. I., p. 124): "The habits, actions, food, and indeed the whole of the economy of the *Dacelo leachii* are so like those of the *D. gigas* that a separate description of them is unnecessary."

A specimen of this bird was presented to our London Zoological Society in 1884.

Fawn-breasted or Buff Laughing Kingfisher (*Dacelo cervina*).

Differs from the preceding species in its smaller size; the tail slightly buffish below; upper mandible blackish-brown with greenish-white tomium; lower mandible greenish-white at the sides with dark brown base, and blue below; feet emerald-green with black claws; irides greenish-white. Female with the tail cinnamon barred with blue. Hab., Northern Australia from Cape York to N.W. Australia. (Sharpe.)

Gould says ("Handbook," Vol. I., pp. 125, 126): "In disposition it appears to be more shy and wary than the *Dacelo gigas* of New South Wales, of which it is a representative. Gilbert, who observed it in the Coburg Peninsula, states that it 'inhabits well-wooded forests, generally in pairs, is extremely shy, and very difficult to procure; is very fond of perching on the topmost dead branch of a tree, whence it can have an uninterrupted view of everything passing around, and where it pours out its loud, discordant tones. Sometimes three or four pairs may be heard at one time, when the noise is so great that no other sound can be heard. The natives assert that it breeds in the honey season, which is during the months of May, June and July.'"

"The food of this Kingfisher is doubtless similar to that of the *Dacelo gigas*. The stomachs of those examined by Gilbert were tolerably muscular, and contained the remains of coleopterous and other kinds of insects."

A. J. Campbell ("Nests and Eggs of Australian Birds," p. 555) agrees with Dr. Sharpe in regarding this as a sub-species of Leach's Kingfisher; he thus describes the nest and eggs:—

Nest.—A hole excavated in termites mound on a eucalypt, sometimes in holes or hollow sprouts of trees—eucalypt, melaleuca, etc.

"*Eggs.*—Clutch, two to three; round oval in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a clutch: (1) 1.62 × 1.38. (2) 1.58 × 1.4. (3) 1.52 × 1.3.

"The eggs of the Fawn-breasted Kingfisher, first described by my friend Mr. D. Le Souef, were taken in November, 1896. He says:—'I noticed this bird on two or three occasions in the open forest country near Cooktown, and found two of their nests, each of which contained three eggs. Both nests were hollows scooped out in termites' nests in eucalyptus trees, one about 30 feet from the ground and the other 50 feet. The birds themselves were shy, and it is astonishing how quickly they hear anyone approaching the tree where they are sitting on their nest, and they frequently fly off before being seen.'"

Three examples of this bird were purchased by the London Zoological Society in May, 1870. Another specimen was deposited in the Gardens by Mr. Walter Rothschild in 1907, and an illustrated account of it published in *The Avicultural Magazine*, Second Series, Vol. V., pp. 172-174; it was imported by Messrs. Payne and Wallace, who again imported the species in 1908.

Red-rumped Kingfisher (*Halcyon pyrrhopygius*).

Above green to the back of mantle, the crown and scapulars streaked with white, the latter feathers white at base or on inner margin, back from mantle orange-

rufous, the upper tail-coverts being centred with greenish; wing greenish blue, brighter on shoulder and outer webs of flights, blackish with white inner edges on inner webs; tail greenish blue with black shafts, inner webs whitish towards distal extremities, outer feather whitish externally; a white eyebrow-streak from base of nostrils, becoming wider above ear-coverts and encircling the occiput below the long crest-feathers; a loral spot, feathers below eyes, and ear-coverts black, joining a collar of the same hue round back of neck; behind the latter a broad white collar joining sides of neck; cheeks and under surface white faintly tinged with buff; bill black, base of lower mandible flesh-white; feet dark olive-brown; irides blackish-brown. Female not differentiated. Australia, excepting in the west and south-west.

Gould observes ("Handbook," Vol. I., pp. 130-132):—"The only parts where I myself observed it were the myall-brushes (*Acacia pendula*) of the Lower Namoi, particularly those growing on the edge of the large plain skirting the Nundawar range. It was usually seen sitting very upright on the dead branches of the myall and gum trees, sometimes on those growing out on the hot plains, at others on those close by the river-side. I succeeded in obtaining both old and young birds, which, judging from the plumage of the latter, I should suppose had left their breeding-place about a month before I arrived in the neighbourhood of the Namoi, in December." "The unusual colouring of the back at once distinguishes it from all the other members of the genus inhabiting Australia, but in its general economy and mode of living it presents no observable difference.

"Two eggs in my collection are very round in form, and of the usual white colour; but they were doubtless pinky white before they were blown. They are one inch long by seven-eighths broad."

Campbell ("Nests and Eggs," p. 557) describes the nest and eggs as follows:—*Nest.*—Usually a hole in a tree, but sometimes a tunnel drilled into the side of a bank or dam.

"*Eggs.*—Clutch, four to five; round in form; texture of shell fine; surface glossy; colour pure white. Dimensions in inches of a clutch: (1) 1.05 × .87, (2) 1.01 × .83, (3) 1.0 × .85, (4) .98 × .85."

Mr. Seth-Smith (*The Avicultural Magazine*, Second Series, Vol. VI., p. 186) mentions specimens of this species as being in a consignment of birds imported by Messrs. Payne and Wallace in 1908.

Sacred Kingfisher (*Halcyon sanctus*).

Above variable blue-green, the back being greener than the wings and tail; inner webs of flights and tail-feathers blackish towards edge; a well-defined eye-brow stripe buff in front, white at back; lores, eyelid, sides of face and ear-coverts black, continued by a black band which encircles the nape; above the latter a white occipital spot; a few black feathers in a line on the cheeks, otherwise the latter, a broad collar round the neck and the under-surface are buff, becoming white on chin, throat, front of breast, and centre of abdomen; under wing-coverts and axillaries deeper buff; flights below dusky inclining to ashy along inner web; bill black, the basal half of lower mandible fleshy-white; feet fleshy-brown; irides dark brown. Female duller than the male, more olive above and on the breast, which is of a pale brownish rather than buffish tint, the feathers with dusky fringes as in the young bird; the bill slightly longer and more gradually tapered than in the male. Hab., "Australia to New Caledonia, the Solomon Islands and New Hebrides, throughout the Papuan Islands to the Moluccas, Celebes, Lombock, Java, and Sumatra." (Sharpe.) Gould says ("Handbook," Vol I., pp. 128-130):—"It is a summer resident in New South Wales and throughout the southern portion of the continent, retiring northwards after the breeding season. It begins to disappear in December, and by the end of January few are to be seen; solitary individuals may, however, be met with even in the depth of winter. They return again in spring, commencing in August, and by the middle of September are plentifully dispersed over all parts of the country, inhabiting alike the most thickly wooded brushes, the mangrove forests which border, in many parts, the armlets of the sea, and the more open and thinly-timbered plains of the interior, often in the most dry and arid situations, far distant from water; and it would appear that, as is the case with many of the insectivorous birds of Australia, a supply of that element is not essential to its existence, since, from the localities it is often found breeding in, it must necessarily pass long periods without being able to obtain it.

"The gaiety of its plumage renders it a conspicuous object in the bush; its loud, piercing call, also, often betrays its presence, particularly during the season of incubation, when the bird becomes more and more clamorous as the tree in which its eggs are deposited is approached by the intruder. The note most frequently uttered is a loud *pee-pee*, continued at times to a great length, resembling a cry of distress. It sits very upright, generally perching on a small dead branch for hours together, merely flying down to capture its prey, and in most instances returning again to the site it has just left. Its food is of a very mixed character, and varies with the nature of the localities it inhabits. It greedily devours mantes, grasshoppers, caterpillars, lizards, and very small snakes, all of which are swallowed whole, the latter being killed by beating their heads against a stone or other hard substance, after the manner of the Common Kingfisher. Specimens killed in the neighbourhood of salt-marshes had their stomachs literally crammed with crabs and other crustaceous animals; while intent on the capture of which it may be observed sitting silently on the low mangrove bushes skirting the pools, which every receding tide leaves either dry or with a surface of wet mud, upon which crabs are to be found in abundance. I have never seen it plunge into the water after fish like the true Kingfishers, and I believe it never resorts to that mode of obtaining its prey. On the banks of the Hunter its most favourite food is the larva of a species of ant, which it procures by excavating holes in the nests of this insect which are constructed around the boles and dead branches of the *Eucalypti*, and which resemble excrescences of the tree itself.

"The season of nidification commences in October, and lasts till December, the hollow spouts of the gum and boles of the apple trees (*Angophoræ*) being generally selected as a receptacle for the eggs, which are four or five in number, of a pinky-white, one inch and a line in length, and ten lines in diameter."

The first example of this Kingfisher reached the London Zoological Gardens in 1868, but the species is not frequently imported. My friend Mr. D. Seth-Smith secured two specimens in 1899, and in the following year he published an account of them, illustrated by a clever coloured plate, drawn by himself (*The Avicultural Magazine*, First Series, Vol. VI., pp. 117-119). He says that "the ordinary note of this species is peculiar, and somewhat difficult to describe, sounding something like *cuio, cuio*, but it not infrequently utters

a note resembling *chip, chip,* like a Crossbill, but decidedly louder. This is probably the note that Gould describes as *pee, pee.*"

New Zealand Kingfisher (*Halcyon vagans*).

Larger than *H. sanctus*, and rather duller on upper parts; eyebrow-streak green; below often rich ochreous-red; bill black, with the basal portion of the lower mandible white; feet dark brown; irides black. Female with the eyebrow-streak less vivid in colouring; breast feathers partly fringed with dark brown, but less strongly than in young birds; bill much longer and more regularly tapered than in the male. Hab., New Zealand; Norfolk Island and Lord Howe's Island.

This is little more than a local race of the preceding species, and, as it is now very little likely to be imported, it is hardly worth while to take up space in considering it further. Three specimens, received in exchange, were acquired by the London Zoological Gardens in 1872.

So far as I am aware, this appears to represent the whole of the Kingfishers hitherto imported, at any rate into the British market; whether any others have reached the Continent I am unable to learn.

The Hornbills (*Bucerotidæ*) do not appear to me to be suitable either for cage-culture or for keeping in any but very large aviaries; they are huge, ungainly, but interesting birds. As they are never in the least likely to be favourites with aviculturists, I cannot see that any advantage would be gained by including them in the present work. I shall therefore proceed with the *Motmots*, which, though rarely imported, are too beautiful to be ignored.

CHAPTER VII.

MOTMOTS (*Momotidæ*).

Linnæus, who only knew of one species of Motmot, regarded it as a Toucan, but Dr. Murie conclusively proved that the *Momotidæ* were most nearly related to the Todies, and placed them in the same section with the Rollers, Bee-eaters, and Kingfishers. Garrod, though he admitted their relationship to the last-mentioned, considered that the Motmots and Todies ought to be placed in one family.

In their general colouring these birds resemble the Rollers; they have long serrated bills and ten to twelve usually long tail-feathers; of these, in most of the genera, the two central ones are rendered spatulate by the action of the birds themselves in biting off the barbs for about an inch a little before the extremity.*

The Motmots inhabit Central and South America; they nest in a hole in a tree or bank, and lay creamy whitish eggs; their food consists chiefly of insects and fruit, and doubtless in captivity they would do well upon a good insectivorous food supplemented by plenty of ripe fruit, a few living insects or their larvæ, and an occasional mouse or small dead bird.

Brazilian Motmot (*Momotus momota*).

Above grass-green; bastard-wing, primary-coverts, and outer webs of flights blue; tail-feathers blue towards the tips, the middle-feathers with the rackets blue tipped with black; centre of crown black; forehead silvery blue continuous with a stripe over eye which deepens behind into ultramarine and encircles the black of the crown; a rust-red patch on back of neck; lores, feathers below eye, and ear-coverts black; above the latter a line of silvery blue and a second between the black of the face and the cheeks; these, the lateral margins of back of crown and sides of neck green, slightly olivaceous; under surface olivaceous-green, rufescent on throat and sides of body; an elongated patch of bluish edged hackle-like feathers on throat; under wing-coverts pale tawny; edge of wing green; flights below dusky, greyish buff on edge of inner webs. Female differs in being slightly greener on under parts. Hab., "Guiana, extending to the Rio Negro along the Amazon region to Para." (Sharpe.)

Burmeister observes ("Systematische Uebersicht," II., pp. 413, 414):—"Schomburgh, who observed it breeding on several occasions, states that it nests in holes in old branches, and in this manner by fraying the tail against the margin of the nest so curiously wears away its two middle tail-feathers. As both sexes exhibit this denudation, they must both incubate." A strange conclusion for this naturalist to come to, and one now known to be incorrect!

Dr. Goeldi obtained this species on the Capim River in 1897, but he does not describe its habits (*cf.*, *The Ibis*, 1903, pp. 496, 497, 498). According to Buffon this species is called "Hutu" by the natives of Guiana, "because every time it takes a jump it utters the note hutu strongly and clearly. This bird lives very solitary, and one only meets with it in vast forests. It neither goes about in communities nor in pairs, one almost always sees it alone on the earth or upon branches at no great altitude, then so to speak it does not fly at all, it only takes active leaps and utters its hutu, and that moreover very early before other birds have commenced their song. Piso is wrongly informed in that he says that this bird builds its nests upon great trees. It contents itself by searching on the surface of the earth for the burrow of an Armadillo, Akuchi, or some other four-footed beast, into which it drags some dry stalks of weeds, in order to lay its eggs therein, the number of which is usually two. In the inner parts of Guiana also these birds are tolerably numerous; they very rarely approach the neighbourhood of human habitations. Their flesh is dry and not exactly eatable. They are caught with difficulty; as they live upon insects, it is difficult to tempt them. Those which are captured adult are miserable and nervous, and will on no account accept food" (*cf.*, Russ, "Die Fremdländischen Stubenvögel," II., p. 676).

Russ says that in 1885 Arminius Bau wrote to *Die Gefiederte Welt* that in the spring of that year a Motmot in the Berlin Zoological Gardens had passed through its moult and had neither bitten off nor broken away the tail-feathers. Amongst other things it received mealworms and moths. Azara's birds ate bread and "preferred even raw meat after they had banged it several times on the ground as though it were some captured prey which must first be killed. Small birds which they hunted some time and eventually killed in this manner they consumed with quite marvellous preference. In like manner they hunted mice. On the other hand, they would not interfere with larger birds. Then again they greedily accepted water-melons and oranges; but, on the other hand, no kind of grain. They despised large pieces and never grasped them with their claws." This Motmot reached the London Zoological Gardens in 1877, and two or three have from

* Dr. Sclater, however, throws doubt upon this statement (see *The Ibis*, 1895, p. 399), but Prof. C. W. Beebe evidently believes in it (see "Two Naturalists in Mexico," pp. 199-201).

time to time arrived at the Berlin Gardens; the last of these is said to have been fed upon worms, beetles, moths, a little meat and egg, but the latter very rarely.

CARTAGENIAN MOTMOT (*Momotus subrufescens*).

Differs from the preceding in being smaller; the band on crown silvery blue becoming purplish at the union on the neck; sides and back of neck chestnut, spreading over the mantle; green of upper surface paler and more buffish; under surface cinnamon reddish with a little green on the throat; irides rich brownish red. Hab., "From Panama to Colombia and Venezuela, south to Matto Grosso." (Sharpe.)

There is a good illustration of this bird in the "Catalogue of Birds in the British Museum," Vol. XVII., Plate X., fig. 1. Mr. W. Goodfellow, in a paper describing a journey through Colombia and Ecuador (*The Ibis*, 1902, p. 210), says of *Momotus subrufescens*:—"Fairly numerous on the edges of the forest around the Indians' clearings. They sit so motionless and flat on the branches that they may be easily overlooked." This is all I have come across respecting the wild life. An example was purchased by the London Zoological Society in July, 1860, and, according to Russ, this is the only instance known of its importation; still, a second reached our Gardens in 1890, and now that we have been receiving birds more freely from Venezuela, it is quite likely to be imported again; the only drawback is that, in spite of their great beauty, the Motmots appear to spend a great part of their time, in an aviary, in swinging their tails rythmically like the pendulum of a clock; this, of course, is not especially entertaining to the owner of a bird.

BEE-EATERS (*Meropidæ*).

This is an old-world family of very beautiful birds, related to the Rollers, Kingfishers, Motmots, and Jacamars. The species are brightly coloured, graceful, active, subsisting upon insects which they capture on the wing. They have long, curved, slender bills and short feet; their flight is light, swift, and pleasing to look at; they nest in burrows made by the birds themselves, usually in banks or cliffs, and their eggs are somewhat rounded, pure white, and glossy.

The European species only has been kept in captivity in this country, but on the Continent two other species have come into the bird market. They are not easy to keep, and have not yet been bred. Mr. Reginald Phillipps, in an article upon two young examples of the Common Bee-eater which he kept (*The Avicultural Magazine*, First Series, Vol. VIII.), says that he fed his birds upon carefully-scraped cooked meat, egg-flake, occasionally sultanas or grapes cleaned and cut up, cockroaches and other insects.

AUSTRALIAN BEE-EATER (*Merops ornatus*).

Above buffish-green; lower back, rump, and upper tail-coverts sky-blue, deepest on the last mentioned, but with paler edges; greater wing-coverts rufous edged with green; flights fawn colour, green externally, bluish towards distal extremities and tipped with black; inner secondaries sky-blue; tail black, outer webs narrowly edged with green; back of crown and nape shaded with orange-rufous; a narrow, pale green eyebrow stripe; lores and a broad band enclosing the eye and ear-coverts, black, followed by a line of blue along the cheeks; the latter and the throat yellow, shading into chestnut at centre of the latter, and followed by a broad black band across the lower throat; remainder of under-surface yellowish-green, becoming more emerald-tinted on the abdomen; under tail-coverts blue; under wing-coverts fawn; bill black; feet mealy greenish-grey; irides pale brownish-red. Female rather smaller. Hab., "Australia and the Papuan Islands and Moluccas to Celebes, Flores, and Lombock." (Sharpe.)

Gould says ("Handbook to the Birds of Australia," Vol. I., p. 118): "Its favourite resorts during the day are the open, arid, and thinly-timbered forests; and in the evening the banks and sides of rivers, where numbers may frequently be seen in company. It almost invariably selects a dead or leafless branch whereon to perch, and from which it darts forth to capture the passing insects. Its flight somewhat resembles that of the *Artami*, and, although it is capable of being sustained for some time, the bird more frequently performs short excursions, and returns to the branch it had left.

"The eggs are deposited and the young reared in holes made in the sandy banks of rivers or any similar situation in the forest favourable for the purpose. The entrance is scarcely larger than a mouse-hole, and is continued for a yard in depth, at the end of which is an excavation of sufficient size for the reception of the four or five beautiful pinky-white eggs, which are ten lines long by eight or nine lines broad.

"The stomach is tolerably muscular, and the food consists of various insects, principally Coleoptera and Neuroptera."

This species reached the Amsterdam Zoological Gardens in 1864, but appears not to have been imported subsequently.

COMMON INDIAN BEE-EATER (*Merops viridis*).

Above bright grass-green, ruddy golden at base of feathers, which becomes more pronounced on nape and hind neck; inner secondaries and upper tail-coverts slightly washed with blue; remaining flights reddish-buff, edged externally with green and tipped with dusky black; central tail-feathers with the elongated portion dusky black, remaining feathers fawn-buffish on inner webs; head more golden-green than the back; an emerald-green eyebrow-stripe; lores and a broad band enclosing the eye and ear-coverts black; sides of face washed with blue at base of cheeks and below the black ear-stripe; under surface yellowish-green, becoming more emerald on breast and abdomen; a transverse blue-black band across fore-neck; a patch of silky-white feathers on each side of the vent; under wing-coverts and lining of flights fawn-buff; bill black, with brown tomium; feet pinky-grey, claws horn colour; eyelids smoky brown; irides bright red. Female with the blue on sides of face a little less pronounced. Hab., Egypt and North-East Africa, extending to Senegambia, eastwards through Persia and Baluchistan, over Continental India southwards to Ceylon, and eastwards to Burma and Cochin China.

Jerdon says ("Birds of India," Vol. I., pp. 205, 206): "It is a very common bird, and is a most characteristic adjunct of Indian scenery. It generally hunts, like the Flycatchers, from a fixed station, which may be the top branch of a high tree, or a shrub, or hedge, a bare pole, a stalk of grain or grass, some old building, very commonly the telegraph wires, or even a mound of earth on the plain. Here it sits looking eagerly around, and on spying an insect, which it can do a long way off, starts rapidly, and captures it on the wing with a distinctly audible snap of its bill; it then returns to its perch, generally slowly sailing with outspread wings, the copper burnishing of the head and wings shining

conspicuously, like gold, in the sunbeams. Sometimes it may be seen alone or in small parties, seated near each other, but hunting quite independently. It frequently takes two or three insects before it re-seats itself on its perch, and in the morning and evening they collect in considerable numbers, and, often in company with Swallows, hawk actively about for some time. I have seen one occasionally pick an insect off a branch, or a stalk of grain or grass; and Mr. Blyth informs me that he has seen a number of them assembled round a small tank, seizing objects from the water, in the manner of a Kingfisher.

"They roost generally in some special spot, sometimes a few together in one tree; but at some stations all the birds for some miles around appear to congregate and roost in one favoured locality. The bamboo tops at Sangor is a celebrated spot of this kind. Here Crows, Mynas, Parrakeets, Bee-eaters, Sparrows, etc., collect from miles around, and the noise they make towards sunset and early in the morning is deafening.

"The Bee-eater has a loud, rather pleasant, rolling, whistling note, which it often repeats, especially in the morning and towards the evening, and often whilst hunting. They sometimes collect in small parties towards sunset on a road, and roll themselves about in the sand and dust, evidently with great pleasure.

"They breed in holes, in banks of ravines or of rivers, and on road-sides, laying two to four white eggs. Burgess mentions that in a nest that he examined there were three young ones, all of different ages. They breed from March to July, according to the locality, earlier in the north of India, later in the south. Mr. Blyth observed them breeding near Moulmein as late as the middle of August."

Russ says that Emil Linden received one of these birds from Miss Christiane Hagenbeck under the name of "Bee-eater from the Cape," which he possessed for a number of years, although he had not received it in good condition. He fed it for a great part of the year upon Tanager food, as well as mealworms and currants, of which it consumed a considerable amount daily; also for a short part of the year it received bees, wasps, etc., wasps being particularly supplied in the autumn, when they were abundant. He kept it in a cage by itself, as he dared not trust so delicate a bird with others. Its cage was placed in a lofty position, and as soon as it saw him raise the ladder it became aware that its master was bringing it fresh food, and began to greet him with a very pleasing and loud whistle, which it prolonged variously into certain harmonies resembling the song of the Chinese Laughing-Thrush (*Leucodioptron chinensis*), to which Mr. Linden thought it might have listened. The bird was not shy, but confiding, and would take a mealworm from his fingers; it was not a greedy bird, and always left a good deal of its food untouched. It is somewhat strange if this Bee-eater actually mimicked the song of a Laughing-Thrush. I do not think the species of *Merops* are usually regarded as imitative birds.

Mr. Phillipps, who offered a bee to his young European Bee-eaters, says that the bird which accepted the insect failed to cripple before swallowing it, and evidently got stung inside in consequence, as it seemed to be in some trouble afterwards; but probably an adult bird would be more circumspect.

TOUCANS (*Rhamphastidæ*).

These are strikingly coloured arboreal New World birds of bizarre appearance, perhaps more nearly related to the *Capitonidæ* than to any other family, having enormous compressed bills almost like the claw of a lobster, with arched culmen, terminating in a decurved tooth, the cutting edges sub-serrate or undulated, and the tongue long and fringed or feather-like, in which last characters they somewhat resemble the Motmots, though in other respects they differ greatly from them. The bills of the sexes differ a good deal, that of the male being usually very distinctly longer, and, when viewed in profile, frequently narrower and with the culmen less arched than in the female. The wings are short, and appear weak, but the birds fly swiftly and in a direct line, and the feet have two toes directed forwards and two backwards.

As might be expected, Toucans hop clumsily on the earth, but move actively among the branches of trees. They nest in holes in trees and lay white eggs. Their food in a wild state consists of various fruits, insects, small birds and mammals. In captivity grapes, soaked sultanas, red or white currants, banana, pear, apple, or the pulp of orange cut up small, insects, a small bird or mouse occasionally, and a good insectivorous soft food, containing egg and ants' eggs, are most suitable. They are fond of bathing, but should not be exposed to extreme cold; therefore in winter they should be kept indoors.

When at roost Toucans bury their huge bills in the feathers of the back, and turn back their tails, which are capable of remarkable vertical movement; this gives them a very strange appearance.

Great-billed or Toco Toucan (*Rhamphastos toco*).

General colour black; rump, throat, and fore-neck white, the latter slightly tinged with yellow and narrowly margined behind with red; lower tail-coverts crimson; bill orange, the upper mandible with a large oval black blotch near the extremity; irides green and yellow with a broad blue orbit; naked orbital skin orange. Female with a much shorter bill, narrower at base (which is unusual). Hab., Guiana, Lower Amazon, Brazil, Bolivia, Paraguay, and N. Argentina.

Mr. E. W. White ("Proceedings of the Zoological Society," 1882, p. 620) says:—"This Toucan I shot among the lofty forest-trees; they go generally in large flocks, and their flight is extremely swift, and in a straight line.

"They are wild, and by no means plentiful in this neighbourhood; but in Misiones I likewise met with them in greater abundance, where they, in company with the Parrots, commit dreadful havoc amongst the orange-groves."

Mr. J. G. Kerr, writing on the "Birds of the Gran Chaco" (*The Ibis*, 1901, p. 217), says: "I must not forget to mention the Toco Toucan (*Rhamphastos toco*), of which small companies were often noticed flying across from one piece of woodland to another." Later on he speaks of a "flock of five," seen at Villa Conception on September 28th.

Schomburgk stated that at times this species devoured the fruits of the various kinds of Spanish pepper (*Capsicum*); also, that in captivity it accepted all varieties of human food, including flesh and fish; nevertheless he doubted whether the bird itself ever captured fish, small lizards, and birds, as several other writers have asserted. Burmeister also observed that no authentic observation of the fact had come to his knowledge; nevertheless, I have seen a much smaller Toucan chasing Sparrows, and there can be no doubt that these birds do vary their fruit diet in this manner.

This species first reached the London Zoological Gardens in 1863, since which time it has come to hand fairly frequently, the last recorded in the ninth edition of the Society's List having been received in 1894; it arrived at the Amsterdam Gardens as long ago as 1851. From its great size (22 inches), it is hardly suitable for

a cage, but should have a small aviary to itself, or a large one in company with other powerful birds.

Sulphur-breasted Toucan (*Rhamphastos carinatus*).

General colour black; nape washed with maroon-purple; rump white; throat and fore-neck yellow, edged behind with reddish; under tail-coverts scarlet; "bill dark with red tip and a large yellow blotch on upper mandible,"* bright green with blue cast, with red tip, narrowly black-edged at base, a wedge-shaped red spot at base of upper mandible. Female much smaller, and with an altogether shorter and more abruptly terminated bill. Hab., "Southern Mexico, Yucatan, Guatemala, Honduras, and Nicaragua." (Sclater.)

Mr. A. Boucard, writing on the "Birds of Yucatan," "Proceedings of the Zoological Society," 1883, p. 455), remarks:—"Said to be very common in all parts of the State, though I have not found this to be the case. Only six specimens have been observed by me during the year. It is also said to go in immense flocks, but I have only seen solitary individuals. It lives upon fruits, and is found in the forests, rarely in the settlements, and never in the towns."

The first specimen of this Toucan was purchased by the London Zoological Society in 1860, since when many examples have been exhibited at the Gardens. A specimen in the Berlin Gardens was studied as regards the colouring of the soft parts with the following result:—"Bill bright green with bluish showing through it, with red tip, narrowly bordered with black at the base; at the base of the upper mandible a cuneiform red spot, which also, towards the front, appears to be shaded with deeper red; eyes brown-black; naked orbital region torquoise-blue, with greenish reflection; feet blue-grey."

Short-billed Toucan (*Rhamphastos brevicarinatus*).

Differs from the preceding in the better defined and broader collar on the nape; it is also smaller and has a shorter bill. Female smaller than male; her bill is considerably shorter, with more arched culmen, but with shorter and more abruptly-formed terminal hook. Hab., "Costa Rica, Veragua, Panama, and Northern Colombia." (Sclater.)

Dr. O. Finsch ("Proceedings of the Zoological Society," 1870, p. 585) regards this as a mere variation of the preceding, and states that the reddish nuchal band varies in individuals. It is probably a local race differing somewhat in size and form of bill; whether the colouring of the soft parts differs remains to be seen. I have found no published account of the wild life. A specimen was presented to the London Zoological Gardens in October, 1884, and a second was received

Outlines of Heads of Male and Female of *Selenidera maculirostris* to illustrate the Sexual Differences in Beaks of Toucans.

* Sclater in catalogue.

in exchange ten years later. In the trade it is quite likely that it may have been confounded with the typical Sulphur-breasted bird.

SWAINSON'S TOUCAN* (*Rhamphastos tocard*).

General colour black; neck and upper back washed with maroon; upper tail-coverts white; below, throat and neck sulphur-yellow, bordered behind by a scarlet band; under tail-coverts scarlet; upper mandible crossed from nostrils to tomium by a diagonal black line, above which it is yellow and below it more or less red; irides red. Female not differentiated, but doubtless smaller, with shorter and less tapering bill. Hab., "Nicaragua, Costa Rica, Panama, and Western Ecuador." (Sclater.)

Stolzmann observes ("Taczanowski's Ornithologie du Pérou," Vol. III., p. 146): "I suppose that the name of this bird, *dios-te-de*, is derived from the plaintive note which, to a certain extent, resembles those words, accentuating the letters of the word *dios* and *e de*. One hears it in the forest throughout the day, especially in the morning and evening. It is equally social to the other *Rhamphastidæ*. I have also found it between Omia and Sorritor, at 4,500 feet elevation."

Mr. W. Goodfellow says (*The Ibis*, 1902, p. 215): "Although this Toucan was fairly numerous at Santo Domingo, we only secured two males during our stay there. It was very shy, and kept to the highest trees, generally in flocks of from eight to a dozen. Iris pale blue, bare skin round the eye yellowish-green; lower mandible black, upper mandible yellow, shaded with blue and green down the centre. The Ecuadorians call these birds 'Predicadores' or 'Dios-te-de.'"

This is all I have found respecting the wild life. A specimen reached the London Zoological Gardens in August, 1876, but Dr. Russ appears to have overlooked the fact.

RED-BILLED TOUCAN (*Rhamphastos erythrorhynchus*).

Black; upper tail-coverts yellow; throat and neck white; a pectoral band and under tail-coverts scarlet; bill red, with a broad yellow band margined with black at base; tip of lower mandible black (according to Reichenau a bright bluish, black-margined transverse band); feet black; irides blue-grey; orbital patch bright blue. Female smaller than the male, with distinctly shorter bill, less curved at the tip. Hab., Guiana, Lower Amazon, and N. Brazil.

Dr. Emil A. Goeldi (*The Ibis*, 1897, pp. 157-158) says: "Striking is the difference in the cry of *Rhamphastos erythrorhynchus* compared with that of *R. ariel* and *R. discolorus*. It is particularly soft, nearly melodious, and may be tolerably interpreted by the syllables *tiu-tiu-fü-fü-fü*."

This species arrived at the London Gardens in 1859 and in 1874; it has also been exhibited in the Berlin Gardens.

CUVIER'S TOUCAN (*Rhamphastos cuvieri*).

General colour black; upper tail-coverts orange, sometimes washed with scarlet; throat and neck white, sometimes washed with lemon-yellow behind; pectoral band and under tail-coverts scarlet; bill black, with the culmen and a basal band yellowish; irides orange-yellow; naked orbital patch blue. Female not differentiated, but probably slightly smaller than the male, and with shorter bill. Hab., "Colombia, Ecuador, and Upper Amazonia." (Sclater.)

Stolzmann says (Taczanowski's "Ornithologie du Pérou," Vol. III., p. 147): "This Toucan keeps in small companies, more rarely in pairs or alone. Like the other representatives of the family, it remains chiefly on tall trees, rarely descending to the lower branches. Its voice nearly resembles that of *R. tocard*, but is a little more simple, composed of two notes. It is a very restless bird, though clumsy in its actions, or, at any rate, its beak gives it that appearance."

Mr. Walter Goodfellow (*The Ibis*, 1903, pp. 215, 216) says: "A series of males and females from the Rio Napo, where they were extremely numerous. This was remarkable, for the Indians slaughtered them by the hundred, and at certain seasons organised expeditions especially for killing them. I have seen them return from these expeditions with many hundreds of smoked Toucans, which they keep to eat out of the fruit season, when game is scarce. When the fruit is ripe on certain forest trees, the Indian lads are sent to make a temporary dwelling under the branches, and they take up their abode there while the fruit lasts, each boy selecting a tree to himself. With their silent blowpipes they pick off all birds that come there to feed. Considering this wholesale slaughter, it is a wonder that this Toucan and many other birds have not long ago become extinct, in the Napo region at any rate. The Indians use the feathers for decorating their weapons and persons, while from the bills they carve quaint necklaces. The bare skin around the eye is shaded Oxford blue. Indian name, 'Dumbiqui.' When we were on the Napo we only met this Toucan singly or in pairs."

The first example of Cuvier's Toucan reached the London Zoological Gardens in December, 1871, and a second in October, 1875; it has also been represented in the Berlin Gardens.

KEEL-BILLED TOUCAN (*Rhamphastos culminatus*).

A smaller representative of the preceding, with much smaller and differently shaped bill. Hab., "Eastern Peru, Bolivia, Ecuador, and Colombia." (Sclater.) I have found no notes on the wild life of this bird. A specimen arrived at the Berlin Zoological Gardens in 1897.

ARIEL TOUCAN (*Rhamphastos ariel*).

Black; upper tail-coverts scarlet; whole throat and neck orange; a broad pectoral band and the under tail-coverts scarlet; bill black, with a basal yellow band, the culmen blue-grey at base; feet leaden-grey, with black claws; irides bluish; naked orbital patch dark red. Female with shorter bill, with shorter terminal curvature; the flattened basal portion of the culmen often considerably broader, but this may not be a reliable character. Hab., Eastern Brazil.

Burmeister ("Systematische Uebersicht," Vol. II., p. 206) says: "In the coastal forest region this species is the commonest; one even meets with it in the vicinity of Rio de Janeiro, and especially in the forests on the Organ Mountains. At New Freiburg I have seen many examples, and once also a young bird which was fed with potatoes, mandioc, and Spanish potatoes. The Brazilians frequently trap the bird, because its flesh affords them agreeable food. Cooked with rice, the dish resembles a good pigeon broth, and is quite tasty. By the Indians the beautiful yellow gorget is especially utilised as an adornment, but the bird is in like manner generally eaten by them."

This bird first arrived at the London Zoological Gardens in 1859, since when many have come to hand; it reached the Amsterdam Gardens still earlier—in 1853. Prince Ferdinand of Bulgaria possessed it in 1878, when it was to be seen in most naturalists' establishments;

* In "How to Sex Cage-birds," I adopted the name "Doubtful Toucan," used in the Zoological Society's List, but this name ought certainly to be used preferably for *R. ambiguus*.

in that year Miss Hagenbeck exhibited it at an exhibition of the "Ægintha" Society at Berlin.

Sulphur and White Breasted Toucan (*Rhamphastos vitellinus*).

Black; upper tail-coverts scarlet; throat and sides of neck white; fore-neck yellow; a broad pectoral band and the under tail-coverts scarlet; bill black, with a pale blue basal band on under mandible, tomium white; naked orbital patch blue. Female smaller than male, and with a considerably shorter bill. Hab., "Trinidad, Venezuela, Guiana, and Lower Amazonia." (Sclater).

I have found no notes respecting the wild life of this bird. It was purchased by the London Zoological Society in 1872, and seems not to have reached any other public gardens.

Green-billed Toucan (*Rhamphastos dicolorus*).

Black; upper tail-coverts scarlet; cheeks, throat, and breast pale brimstone-yellow with a central orange patch; upper half of abdomen and under tail-coverts scarlet; bill pale green with a black basal band, tomium bright red; feet dark leaden grey with black claws; eyelids blue; irides grey-blue with green reflections; naked orbital patch vermilion. Female apparently with longer and somewhat narrower bill than the male, the sexual differences being reversed in this species. Hab., "S.E. Brazil and Paraguay." (Sclater.)

Burmeister says ("Systematische Uebersicht," Vol. II., p. 205): "This Toucan is the commonest species in the regions of the interior which I have visited. I received it in Minas Geraes at all places where I stayed for a moderate time; one also hears its rattling voice continuously in the woods, and not infrequently has the opportunity of seeing the bird at roost in the distance, its varied plumage making it easily recognisable. In the neighbourhood of forest it appears to be absent, since Prince Wied did not observe it. Its mode of life presents nothing unique; the trapped young bird which I possessed for a long time preferred to eat cooked potatoes and roots of manioc, which, however, had to be offered to him to induce him to accept them; old birds will neither let themselves be caught nor tamed."

This well-known Toucan first arrived at our London Gardens in 1876, since when it has been exhibited in many other public gardens, at bird shows, and has been owned by various aviculturists.

Cayenne Aracari (*Pteroglossus aracari*).

Above dark, almost metallic, green; rump scarlet; head and nape, throat and neck black; ear-coverts with a wash of chestnut; below pale yellow; a scarlet ventral band; flanks and under tail-coverts rufescent green; upper mandible yellowish white with a broad black stripe on the ridge and a black basal streak; lower mandible black with a narrow white basal line; feet greenish-grey; irides brown; naked orbital region slate-black. Female not differentiated. Hab., "Guiana, Cayenne, Surinam, and Lower Amazonia." (Sclater.)

Prince Maximilian of Wied met with it in primeval forest, and describes its manner of life as similar to that of other Toucans; he saw it in numbers roosting on the uppermost dry branches of forest trees, from which its short two-syllabled note, somewhat like "Kulik Kulik," sounded. As a rule it lives in pairs, but after the breeding season in small flocks, which wander about in search of fruits. In the cool part of the year, when most fruits are ripe, they often leave the woods and approach the coasts and plantations, where many of them are killed on account of their flesh, which is pleasant tasting and also plump in the cool season. They fly archwise and jerkily like the other Toucans, and flap little with their wings; when at roost, like the European Magpie, they beat up and down with the tail. The nest is found in holes in trees or branches with only two eggs. They pursue and drive off with abuse birds of prey, and especially Owls (*cf.* Russ, "Die Fremdländischen Stubenvögel," Vol. II., pp. 650, 651).

Russ says that this species reaches their market extremely rarely; it arrived at the Amsterdam Gardens in 1882, and is at present in the Berlin Gardens.

Maximilian's Aracari (*Pteroglossus wiedi*).

Differs from the preceding in the narrow stripe on the culmen and greener thighs. Female rather smaller than male, with smaller bill, the culminal stripe often, but perhaps not always, wider, especially at the base. Hab., "Lower Amazonia and S.E. Brazil." (P. L. Sclater.)

Burmeister says ("Systematische Uebersicht," Vol. II., pp. 207, 208): "In the whole tract of Brazil which I travelled over this bird is common; one finds it abundantly in pairs sitting quietly on isolated trees, and from time to time hears its cry—Kulik, Kulik. Its flocks are not in great numbers, five to six, rarely more. The bird is not very shy, and in its behaviour much resembles the Magpie; like it it beats with its tail and flies in the same jerky manner, with short quick flaps of the wing; it also delights in attacking birds of prey, especially Owls, and abuses them like Jackdaws."

The London Zoological Society first secured this bird in 1872, after which others came to hand from time to time. It seems to be merely a local race of *P. aracari*.

Banded Aracari (*Pteroglossus torquatus*).

Above dark green; a narrow chestnut collar on the back of neck; rump scarlet; head, throat, and neck black; below pale yellow; a black spot on chest; breast more or less washed with crimson; a black abdominal band more or less varied with crimson; thighs chestnut; bill black, with the upper mandible pale yellow, excepting on culmen and towards tip, a narrow white basal line; irides yellow; naked orbital region, blue-green in front, red behind. Female slightly smaller, with a considerably shorter bill having the tip less curved, the culminal stripe sometimes narrower than in the male. Hab., "Southern Mexico and Central America down to Panama; also Northern Columbia and Venezuela." (P. L. Sclater.)

Mr. C. F. Underwood (*The Ibis*, 1896, p. 445) says that this bird is not so common on the Volcano of Miravalles as lower down, and this is all I have been able to discover respecting the bird in a state of freedom. The birds of Tropical America generally have been greatly neglected so far as their life-history is concerned, and I cannot but think that this is to a great extent the fault of those who have made a special study of Neotropical birds; they have not cared to know anything about the habits of the creatures brought home, but have devoted all their efforts to securing large series of skins of numerous species; necrology (not biology) is their delight. To me life has always been more important than raiment, and to know something of the habits of an animal far more instructive than to give it a name and put it into its supposed proper place in a list of

species; though, for some unexplained reason, or lack of reason, the latter is considered generally to be far more scientific.

This species first reached our Gardens in 1870, since which others have from time to time been added to the Zoological Society's collection. One was exhibited at the Crystal Palace in 1903.

LETTERED ARACARI (*Pteroglossus inscriptus*).

Above dark green; rump scarlet; head, throat, and neck black; under-surface pale yellow; thighs brown; bill clear ochreous-buff, with the culmen, tip, basal line, and a row of spots along inferior edge of upper mandible black; feet dull lead-coloured; orbital ring turquoise-blue; irides brownish-black. Female with the throat and neck brown. Hab., "Guiana and Lower Amazonia." (Sclater.)

I have found no notes on the wild life, but it probably corresponds closely with that of the other species of its genus. Although, as Mr. Reginald Phillipps says (*The Avicultural Magazine*, First Series, Vol. VIII., p. 300), this species comes over occasionally, it appears only to have reached the Zoological Gardens of Berlin; Russ was of opinion that this was the only instance of its importation alive, but this was an error. In 1902 Mrs. M. Rathborne wrote to the editor of *The Avicultural Magazine* respecting an example in her possession; this bird after recovery from a severe cold, with which at first it was afflicted, was fed upon "a mixture of egg, breadcrumbs, and potato pretty moist, for he will not eat it at all dry; also cut up banana, sweet grapes split, and squills in the drinking water." The squills were probably given to prevent a recurrence of the cold.

SPOT-BILLED TOUCANET (*Selenidera maculirostris*).

Above dark green; flights internally blackish-grey; six middle tail-feathers brown-tipped; head, neck, and breast steel-black, a narrow pale yellow nuchal band; a broad stripe of feathers from the bill below the eye over the ear-coverts, yellow on each side, orange in front and citron-yellow behind; abdomen greenish; flanks orange; thighs brown; under tail-coverts scarlet; bill pale yellowish-white or greenish-yellow, greener in front with some very variable broad bands and transverse blotches on the upper mandible, the base of culmen and a more or less defined band towards tip of lower mandible, black; feet greenish grey. Female smaller; with chestnut instead of black on head, neck, and breast; the broad streak on the lower portion of the ear-coverts green instead of orange and yellow; the bill shorter, less tapering, but more distinctly hooked at tip. Hab., South-eastern Brazil.

Burmeister ("Systematische Uebersicht," II., p. 211) says:—"They sat about five or six together roosting on not particularly lofty trees in the open field, and were hopping boldly about like Parrots, busy in searching for fruit, until my appearance alarmed them, and they hurried away screaming."

According to Prince Maximilian the habits of this species do not differ from those of its allies, and I have been unable to find any definite account by recent collectors or explorers.

This little Toucan is not frequently imported, but it reached the Berlin Gardens in 1874, those of London in 1879 and 1880. In 1878 Linz, of Hamburg, imported it, and at the same time Miss Hagenbeck received two examples which she exhibited at the exhibition of the "Ægintha" Society in Berlin.

BARBETS (*Capitonidæ*).

Birds mostly of brilliant colours (though there are some notable exceptions) inhabiting Africa, Asia and Tropical America. Like the Toucans, they live chiefly upon berries and fruit, but also take insects, and in captivity will accept flesh. They lay white eggs in holes in trees, and their cry is loud and resonant. Their bill is short, stout, often with long basal bristles; their feet are short and the toes are in pairs, the outer anterior toe being turned backwards; the wings are short and rounded, and the tail short or of moderate length, consisting of ten feathers. They are heavy in their actions, arboreal in habits, rarely coming to the ground, upon which they hop; their flight is short. The plumage of the sexes differs very slightly, but the females generally have a shorter and broader bill than the males; in size also the sexes appear to differ, in some species one sex being larger, in others the other sex.

In captivity I should be inclined to treat the Barbets in much the same manner as the Toucans, but with less animal food.

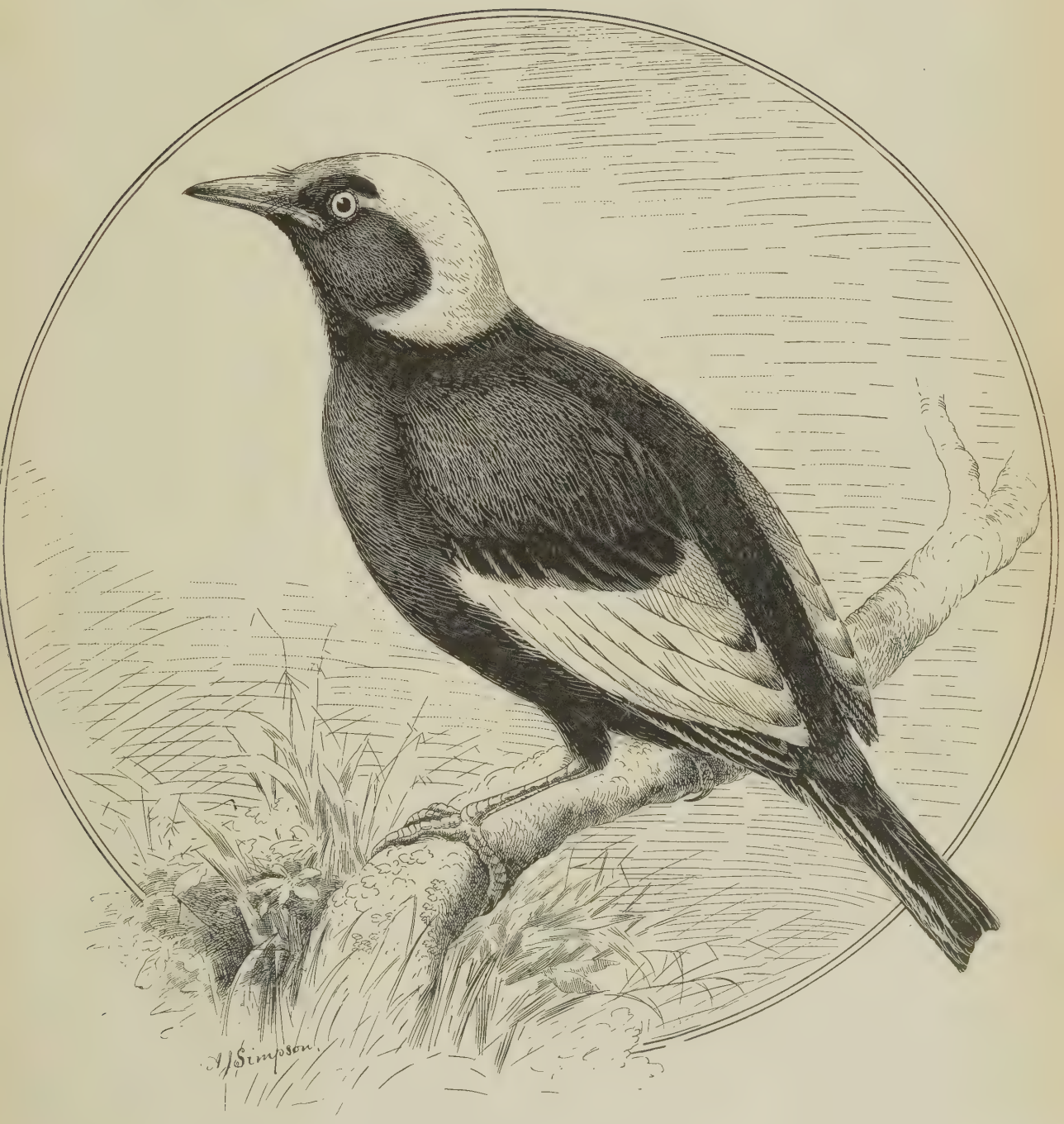
GREAT BARBET (*Megalæma virens*).

Above brown, slightly rufescent; median wing-coverts shaded with maroon; all the coverts edged with greenish or greenish-blue; flights externally similar, inner ones tipped with cinnamon; lower back, rump, and upper tail-coverts grass-green, with paler edges; tail green above, bluish below; head and throat verditer-blue, inclining to greenish; sides of face and ear-coverts black; lower throat dark brown; breast and abdomen prussian blue, the latter streaked with yellow; sides and flanks also streaked, the former cinnamon and the latter green; thighs dull yellowish-brown; under tail-coverts scarlet; under wing-coverts pale yellowish, edge of wing green, flights below dusky with pale yellow inner edges; bill and gape wax-yellow, dark horn-colour towards end of upper mandible, white at tip of lower mandible; feet dull sap-green, claws horn-coloured; irides dark brown. Female smaller than male, with slightly longer wing but shorter tail. Hab., "Hills of Southern China, extending into the Burmese and Tenasserim Hills." (Shelley.)

In Oates' edition of "Hume's Nests and Eggs of Indian Birds," Vol. II., pp. 319, 320, we read:—"Major C. T. Bingham found the nest of this species in Tenasserim. He says:—'On the 12th February, on the bank of the Mekhnaychoung in the Thoungyeen Valley, I found my first nest of this bird. It was in a hole of a jungle tree, name unknown, at a height of about 30 ft. from the ground. Not made, as many Barbets' nests are made, on the underside of a branch, but bored into the upright stem for about 3 in., terminating in a natural hollow, at the bottom of which, on the bare wood, lay three fresh eggs, broad ovals, dull white, but only here and there with faint traces of a gloss. A second nest of the 3rd of March at Meeawuddy contained two young ones.

"'A third, found on the 26th March on the bank of the Maiglachoung, contained one young one, apparently just hatched, and one very hard-set egg. This was in a hole in a dead teak tree, at about 20 ft. from the ground, and was, like the first, an entrance bored into a natural hollow, which was unlined.

"'I am glad to say that, though the getting-out of the egg necessarily enlarged the entrance-hole, the birds did not desert their young one, for I saw them feeding it the next day. The four eggs procured mea-



THE REGENT BIRD.

sured 1.35 × 1.06, 1.30 × 1.05, 1.32 × 1.05, and 1.37 × 1.01.'"

The eggs are in shape broad ovals, always somewhat, often conspicuously, pointed towards the small end. In colour they are pure dull white, with only here and there in some eggs a faint trace of gloss."

The London Zoological Society purchased its first example of this Barbet in 1876; others were secured in later years; in 1895 the Berlin Gardens acquired the species. In 1908 an example was exhibited by Mr. Townsend at the London Cage-Bird Association's Show.

Blue-cheeked Barbet (*Cyanops asiatica*).

Above pale grass-green; primary-coverts and primaries slightly darker green, the latter externally yellowish towards the tips; tail green above, blue below; crown, nape, and lores scarlet; a yellowish line towards the forehead, followed by a black band, which is continued backwards above the eyebrow; the latter and sides of head generally bright sky-blue, as also is the throat; sides of neck and under surface generally yellowish-green; a spot of scarlet on each side of the throat; under wing-coverts buffish; flights below dull brown, yellowish at inner edges; bill greenish-yellowish-horn with black culmen; feet dull green; margins of eyelids orange; irides hazel to reddish-brown. Female apparently rather larger, but with shorter wing and tail; her bill is slightly shorter and broader, and the culmen, seen in profile, is rather more arched. Hab., "Himalayas from Cashmere eastward to the Burmese countries and Northern Tenasserim, occuring also in Dacca and near Calcutta." (Shelley.)

Jerdon ("Birds of India," Vol. I., pp. 313, 314) says:—"Buchanan Hamilton states that it breeds in holes in trees, which it excavates itself. 'The name *Bussunt bairi*,' says he, 'signifies the old woman of the spring.' Tickell describes a nest made of grass, and placed in a Morva tree, as belonging to this species, but of exceedingly doubtful origin, I imagine. Pearson states that it has two broods in the year.

"It is rather a noisy bird, with a very peculiar call, which Sundevall endeavours to imitate by the word *rokuroj-rokuroj*; and it is syllabilised by Blyth as *kuruwūk, kuruwūk, kuruwūk*. It is more subdued than the call of the last group (*Megalæma*), but still considerably like it, without the preliminary cachinnation. It hops actively about the branches of trees, and lives entirely on fruit, which Sundevall said he found always broken asunder."

In Hume's "Nests and Eggs," Vol. II., pp. 320, 321, are the following notes:—"Mr. R. Thompson says:—'The Blue-throated Barbet breeds in April and May, digging out holes in the decayed branches of trees.

"'It is a common breeder in our Kumaon forests, keeping entirely to the hilly regions. "Kuttooruk, kuttooruk, kuttooruk," is its cry.'

"Mr. Blyth tells us that in Lower Bengal it has two broods, one in the month of May, the other in November.

"Colonel G. F. L. Marshall says that his shikaree found a nest-hole in Kalsi Grove (Dehra Doon). 'The entrance was on the water side of a bough about 15 inches in girth, and near the top of the tree. The hole was circular, and about 10 inches in depth.'

"Several nests found in May in the neighbourhood of Darjeeling each contained three fresh eggs. One was in a hole in a large tree about 6 feet from the ground; two others were in holes in large branches of trees. The one first mentioned had a large pad of shavings, apparently taken off by a plane, and collected by the birds. The others had scraps of decayed wood as a bed for the nest.

"Another nest-hole found in July contained three fresh eggs, had also in it a large pad, consisting almost exclusively of coarse vegetable fibre, apparently strips of the bark of some herbaceous plant, but a few pieces of grass, a piece of red wool, and one or two other similar miscellaneous scraps are intermingled in the pad. Whether the Barbets can possibly themselves collect these pads, or whether they take possession of holes in which other species have already collected them, I have not been able to ascertain.

"The eggs vary from rather broad to considerably elongated ovals, and are not uncommonly slightly pointed towards one end. The shell is fine and compact, and in some specimens has a slight gloss, in others is dull and almost entirely glossless. The colour is, of course, pure white.

"In length the eggs vary from 1.03 to 1.13, and in breadth from 0.79 to 0.87; but the average of eight eggs is 1.09 by 0.83."

A tolerably frequently imported species, which first arrived at the London Zoological Gardens in 1866, a good many other specimens having since come to hand. Both in Germany and England various aviculturists have owned specimens, one in Miss Alderson's possession being described by her as recently as February, 1908. (*The Avicultural Magazine*, Second Series, Vol. VI., p. 129.)

Golden-throated Barbet (*Cyanops franklini*).

Above golden grass-green; lesser wing-coverts deep blue, median and greater coverts edged with blue; bastard-wing, primary-coverts, and flights black, blue externally, excepting the secondaries, which are green; crown bright golden yellow shading into scarlet on forehead and nape; sides of head black; bluish on sides of nape; ear-coverts ashy-greyish, extended over back of cheeks and lower throat; front of cheeks, chin, and upper throat golden yellow, rest of body below yellowish green; tail below blue; under wing-coverts yellowish buff, tinged with green; flights below blackish, yellowish along inner edges; bill black at tip, diffusedly grey at base; "feet green, claws dusky; iris brown" (J. Scully); "feet pearl bluish, irides orange-yellow in Grönvold's drawing from life. Hab., 'Eastern Himalayas, Assam, and Manipur.'" (Shelley.)

Jerdon says ("Birds of India," Vol. I., p. 314):—"This handsome Barbet is very common at Darjeeling—that is, at a certain altitude, from 4,000 feet to 8,000 feet, and upwards. Its usual cry is something like *kattak-kattak-kattak*. It lives entirely on fruit."

The following notes are from Hume's "Nests and Eggs," Vol. II., p. 322:—"According to Mr. Hodgson's notes, this species, the Golden-throated Barbet, begins to lay in April, breeding in holes in trees in the central hills of Nepal and Sikkim, and in the Terai. The nest-hole is about 10 or 12 inches in depth; the eggs, three or four in number, are pure white, and one that is figured measures 1.1 by 0.85 inch; a broad, regular oval.

"Mr. Mandelli has favoured me with an egg of this species taken at Ginzon the 5th August, at an elevation of about 3,500 feet. The nest-hole was placed in a medium-sized tree at about 8 feet from the ground, and contained two fresh eggs.

"The egg is a moderately broad oval, pure white, and with very little gloss, and measures 1.11 in length by 0.82 in breadth."

Mr. Reginald Phillipps acquired two specimens of this pretty species in September, 1902, which he subsequently forwarded to Mrs. Johnstone, and one of them eventually found its way to our London Zoological Gardens. Mr. Phillipps has published an interesting illus-

trated account of these birds in *The Avicultural Magazine*, Second Series, Vol. III., pp. 323-330. He fed them "almost exclusively on fruits and vegetable matter, including cut-up raisins."

COMMON GREEN OR JUNGLE BARBET (*Cyanops caniceps*).

Bright green, streaked and spotted with yellowish above; wing-coverts slightly browner green; primaries dusky, green externally; inner secondaries green with yellowish spots; lower back, rump, and upper tail-coverts without stripes; tail green above, bluer below; head, neck, throat, and breast brown streaked with whitish, excepting on the throat; lores, front of cheeks, and chin dark grey; body from breast backwards emerald-green, slightly brownish on abdomen; under wing-coverts and inner lining of flights yellowish; bill brownish-flesh; feet dull chrome-yellow, claws brown; irides clear brown; naked orbital ring orange-yellow. Female smaller than the male, with shorter wings and tail. Hab., India.

Jerdon ("Birds of India," Vol. I., p. 311) says: "Its loud cry is familiar to every sportsman, wherever its range extends, and is often quite startling. Like the call of the others of this group, it is something like the word *kùtùr, kòtùr, kòtùr*, preceded by a harsh sort of laugh. They continue to call for some minutes at a time, and are heard at all hours, frequently indeed at night, especially when there is moonlight; hence several of the native names. Its usual food is fruit and berries, occasionally insects. Mr. Elliot, in his remarks, notes "one was shot pecking at the flowers of a tree." He further states that on each side of the throat there is a naked spot with the skin wrinkled, which the bird probably contracts and expands when calling."

In Hume's "Nests and Eggs," Vol. II., pp. 322, 323, and 324, we read: "Franklin's Green Barbet breeds in richly-wooded, well-watered districts, especially in the neighbourhood of hilly ground or hills, finding its way up into the valleys of these to an elevation of some 2,000 or 3,000 feet, at any rate, all over Continental, as opposed to Peninsular India. It lays in March and April. At Bareilly I obtained fully-fledged young ones by May 20, and Dr. King, writing from Mount Aboo, says he obtained them on the 25th of that month.

"Three or four is the usual number of eggs found, and these appear to be laid very irregularly, as quite hard-set and almost fresh ones are found in the same nest-hole. These latter, so far as I know, are always excavated by the birds themselves in the trunk or one of the larger branches of some soft-wooded tree, such as the siris. In Bareilly we found no nest-hole at a less height than 20ft., and one was at least 50ft. from the ground.

"There is, of course, no real nest, the eggs being laid on the bottom of the hole amongst a few chips. The hole is comparatively small, not above 5in. in diameter at bottom, from 6in. to 2ft. deep, and the passage, which is very neatly cut and rounded, and nicely bevelled off at the entrance, is only about 2½in. in diameter."

"The eggs are somewhat elongated, very regular ovals, dull white, and slightly glossy. They vary from 1.1 to 1.3 in length, and from 0.84 to 0.95 in breadth; but the average of a dozen eggs was 1.21 nearly by 0.88 nearly."

Russ says that this bird has only once arrived living in Europe, Miss Christiane Hagenbeck having in 1875 brought it to the "Cypria" Exhibition, at Berlin. Of course, a common and widely-distributed Indian bird like this might arrive in the English bird market at any time.

HODGSON'S BARBET (*Cyanops lincata*).

Above grass-green, feathers of mantle and upper back with yellowish-white centres; outer webs of primaries olive-yellow towards the tips; tail green above, bluish below; feathers of crown ashy-whitish edged with brown, more pronounced on hind neck; sides of head whitish, the ear-coverts, hind cheeks, and sides of neck with brown edges to the feathers; throat not at all or very slightly streaked; feathers of fore-neck and breast whitish broadly edged with brown; sides of breast, flanks, thighs, and under tail-coverts pale emerald-green with darker edges to the feathers; under wing-coverts yellowish-white edged with brown; flights below dark brown, yellowish along inner web; bill horn-yellow; feet fleshy yellow, base of claws dusky brown; irides deep brown and reddish-brown; orbital ring deep yellow. Female with a broader bill. Hab., "Himalayas to Assam and the Burmese countries, and reoccurring in Java." (Shelley.)

All that Jerdon tells us about this Barbet is that "its voice is very loud," but in Hume's "Nests and Eggs of Indian Birds," Vol. II., p. 325, we get some information: "According to Mr. Hodgson's notes, this species (the Lineated Barbet) breeds in the valleys of the lower regions of Nepal. It begins to lay about April, and the young are ready to fly by June or July. It excavates a deep hole, some 16in. in depth, in the trunk of some decayed tree, and lays three or four pure white eggs, which are figured as broad ovals, considerably pointed towards one end, and measuring 1.3in. by 0.98in."

Major C. T. Bingham informs us that in Tenasserim "this Barbet was excessively common, but I succeeded in finding only two nests, one on March 25, and the other on April 13. This latter contained four young ones barely fledged. Out of the former, which was a mere hole leading to a shallow hollow in a dried bough of a teak-tree, which, having been cut down years ago, lay propped in a slanting position against a neighbour, I took three fresh eggs, which I found lying on the bare wood. The entrance-hole was irregular and evidently not a recently cut one."

"Some eggs are rather elongated ovals, the shells fine, smooth, and rather fragile, but with scarcely any appreciable gloss. Other eggs are regular ovals, sometimes having a pyriform or even slightly cylindrical tendency; pure white and *fairly*, but not conspicuously, glossy.

"An egg of this species, sent me from Sylhet by Mr. Cripps, measures 1.25 by 0.95. Other eggs measure from 1.16 to 1.38 in length, by 0.83 to 0.91 in breadth."

This species reached the London Zoological Gardens in 1877; in 1881 Jamrach imported it, as also in 1894, and in about 1896 or 1897 it appears to have arrived at the Berlin Gardens.

SMALL GREEN BARBET (*Cyanops viridis*).

Above grass-green, primaries blackish internally, yellowish towards tips of outer webs; inner secondaries bluish; head, hind neck and under-surface ashy-whitish with pale brown edges to the feathers, darker on head, throat, and breast; hind neck slightly greenish and distinctly streaked with brown; sides and flanks bright green with darker edges; thighs and under tail-coverts uniform green; under wing-coverts yellowish-buff; flights below dusky, yellowish along inner webs; bill pale brown, darker at tip of upper mandible; feet greenish-leaden; irides dark brown. Female smaller than male. Hab., Southern India.

Jerdon says ("Birds of India," Vol. I., p. 312): "This is the common Green Barbet of the Malabar

coast, extending up the Neilgherries, where very common in the dense woods, and along the Malabar Ghats as far as N.L. 14 deg. Its voice is not quite so loud as that of the last species (*M. caniceps*). Its flight is, like that of the others of this genus, tolerably rapid, direct, and slightly undulating. It perches generally on the higher branches of trees. I have frequently heard both this and the last species calling by moonlight, and have always found fruit in its stomach."

"Layard relates of the *M. zeylanica* of Ceylon that, in confinement, although it ate fruit greedily, it would yet eat raw meat, and devoured several little *Amadinas* kept in an aviary with it. This is quite in conformity with what has been remarked of the South American Toucans in captivity. Mr. Bennet describes in full detail the despatching of an unlucky Goldfinch by a caged Toucan. All of the species build in holes of trees, laying three or four shining white eggs."

Hume ("Nests and Eggs," Second Edition, Vol. II., pp. 325, 326, 328) says:—"I have never taken the eggs of the Small Green Barbet; but Mr. Davison tells me that 'it breeds very commonly on the Nilghiris, in the trunk or larger branches of dry and partially decayed trees.' Dr. Jerdon seems to question their excavating their own nests; but of this there can be no doubt, as I have repeatedly seen them at work. The holes vary considerably, both with regard to the depth of the entrance-tube, if it may be so called, and also with regard to the depth of the egg-chamber. The hole is shaped something like a retort with a very short neck. The eggs are pure white, rather glossy, and generally nearly as thick at the smaller as at the larger end, but in this, as well as in size, they vary very considerably. The normal number of eggs is, I should say, four, but very often only three are laid, while occasionally even five are found. Nothing is used to line the hole, the eggs being merely laid on a few chips of decayed wood. The bird appears rather to sit over than on her eggs, as she may be seen for hours together with her head sticking out of the hole. Breeds in March, April, and May, and sometimes continues laying even as late as the first or second week in June."

"The eggs of this species, sent me from the Nilghiris by Miss Cockburn and Mr. Davison, are dull pure white, only moderately glossy, more or less broad ovals.

"They vary in length from 1.07 to 1.22 inch, and in breadth from 0.75 to 0.96 inch; but they average 1.13 by 0.86 inch."

Russ states that, so far as he knows, this species has only once been imported alive, by G. Bosz, of Cologne, who sent it to him for identification: nevertheless, a common South Indian bird might appear in the English market any day.

Crimson-breasted Barbet (*Xantholæma hæmatocephala*).

Above yellowish olive-green, many of the feathers with yellow edges, lesser and outer median and greater wing-coverts grass-green, bastard-wing, primary-coverts, and flights blackish internally; primaries yellowish towards tips of outer webs; a broad scarlet frontal band succeeded by a band of black; occiput, nape, and hind-neck washed with bluish; sides of head black; a narrow eyebrow streak and a broad streak below the eye bright sulphur-yellow; hinder cheeks and back of ear-coverts washed with bluish-green; throat bright sulphur-yellow, varied behind with black; sides of neck green, washed with bluish-grey; fore-neck bright scarlet, shaded at back with golden yellow; rest of under surface pale yellow, whitish in the centre, and streaked with green on sides, flanks, and under tail-coverts; edge of wing green; flights below dusky, yellowish along inner edge; bill dark horny slate-colour, paler at base; feet deep coral pink; irides dark brown, with a pale or pearl-grey outer circle. Female smaller and slightly duller than the male. Hab., Ceylon and India, eastward to Burma, and through Malaysia to Sumatra and the Philippines.

Jerdon observes ("Birds of India," Vol. I., p. 316): "It is very common wherever there is a sufficiency of trees, inhabiting open spaces in the jungles, groves of trees, avenues, and gardens, being very familiar, and approaching close to houses, and not infrequently perching on the housetop. As far as I have observed, it does not climb like the Woodpeckers, but hops about the branches like other perching birds. The Rev. Mr. Philipps, indeed, as quoted by Horsfield, states that it runs up and down the tree like a Woodpecker, and other observers have asserted it climbs to its hole; but I confess that I have never seen this, and Mr. Blyth is most decidedly of opinion that the Barbets never climb. This naturalist found that one which he kept alive would take insects into its mouth and munch them, but swallowed none of them, and forsook them immediately when fruit was offered. Its chief food is fruit of various kinds, sometimes *perhaps* insects. It has a remarkably loud note, which sounds like *took-took-took*, and this it generally utters when seated on the top of some tree, nodding its head at each call, first to one side, then to another. Sundevall states that it is like a rather low note on the flute, from the lower G to the second E. This sound, and the motion of its head accompanying it, have given origin to the name of 'Coppersmith,' by which it is known both among natives and Europeans. The sound often appears to come from a different direction to that from which it does really proceed; and this appears to me to depend on the direction of the bird's head when uttering the call. Mr. Philipps accounts for it by saying that it alters the intensity of its call. Sundevall remarks that 'the same individual always utters the same note, but that two are seldom heard to make it exactly alike. When, therefore, two or more birds are sitting near each other, a not unpleasant music arises from the alternation of the notes, each sounding like the tone of a series of bells.' It breeds in holes in trees, laying two (or more) white eggs. A pair bred in my garden at Sangor, in the cross-beam of a vinery. The entrance was from the under-side of the beam, perfectly circular. It appeared to have been used for several years, and the bird had gone on lengthening the cavity inside year by year till the distance from the original entrance was four or five feet; and it had then made another entrance, also from below, about 2½ feet from the nest. I quite recently observed a nest of this bird in a hole of a decayed branch of a tree, close to a house in a large thoroughfare in Calcutta."

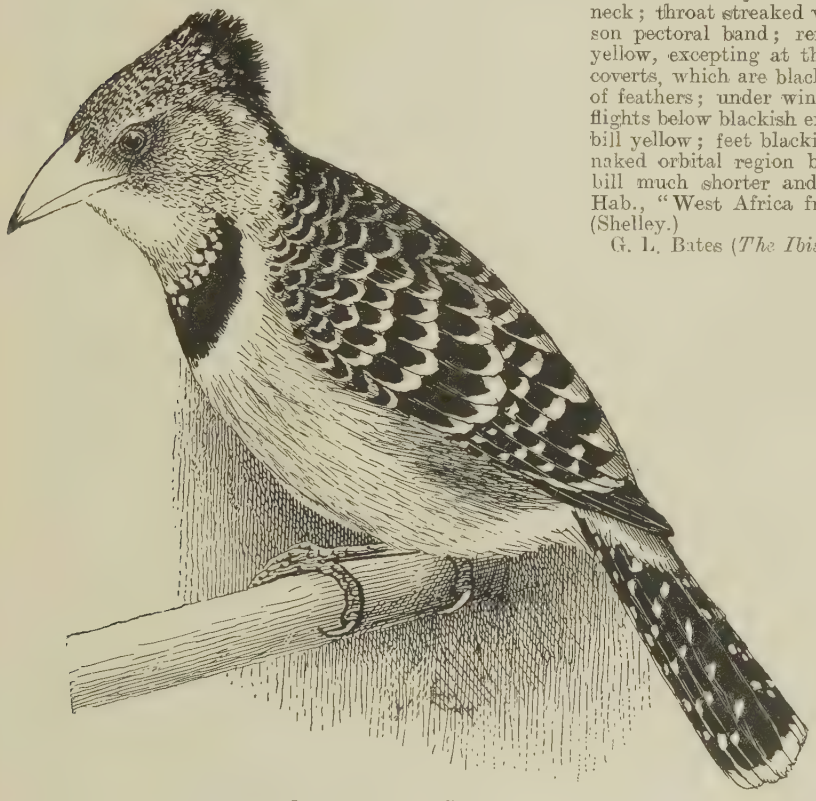
Hume says ("Nests and Eggs," Vol. II., pp. 329. 330, 332): "I have always found the nest of the Coppersmith, or, as Jerdon pleases to call it, the Crimson-breasted Barbet, in March, April, or May; but in Central and Southern India it begins, I believe, to lay earlier.

Sometimes it fixes upon a branch, hollow from end to end, and with a wide natural aperture, but in these cases it generally cuts a new entrance, nearer to the bottom of the cavity, some 2in. in diameter, and always, I think, on the underside of the bough. As a rule, however, like others of the family, these Barbets seem to be able to find out branches that are decayed internally, although externally to the human eye exhibiting no signs of this, and into such, through the harder external shell of the branch, they cut a perfectly circular

hole with the edges neatly bevelled off inside and out. The eggs are at the bottom of the cavity into which they have thus bored (and which they smoothen a good deal interiorly), often a couple of feet below the *door*, and laid merely on the chips produced in the course of the work.

The normal number of the eggs is four, but I have not unfrequently found only three hard-set ones or newly-fledged young birds.

"The hole varies in length from 1ft. to 4ft. or 5ft., and the diameter of the chamber, when, as sometimes happens, this is cut entirely by themselves in sound



LEVAILLANT'S BARBET.

though soft wood, scarcely exceeds 4in. The birds often use the same hole year after year, but generally lengthen it each season."

"The long, narrow, pure white egg of this species, whose fragile shell has rarely much, and is often devoid of all, gloss, reminds one much of those of our Common Indian Swift (*C. affinis*). Typically the eggs are almost cylindrical, tapering somewhat towards one end, but the ends themselves are broad and obtuse, and no tendency to point is observable; they vary, however, much in size, and within certain limits in shape also. Here and there a tolerably perfect oval may be met with, and a slightly pyriform variety is occasionally obtained. When fresh and unblown, like so many eggs of this type, they have a delicate pink blush.

"In length they vary from 0.87 to 1.07 inch, and in breadth from 0.62 to 0.72 inch; but the average of a very large series is 0.99 by 0.69 inch."

This Barbet was added to the collection at the London Zoological Society's Gardens in 1901. Being a common and familiar Indian bird, there is no reason why it should not be freely imported.

PURPLE BARBET (*Trachyphonus purpuratus*).

Glossy black, with blue-black edges to the feathers; lesser wing-coverts wholly white, or with broad black tips; upper tail-coverts narrowly edged with sulphur yellow; a small white spot at end of outer tail-feathers; forehead and eyebrow lake-red, extending to sides of neck; throat streaked with pinkish-grey; a broad crimson pectoral band; remainder of under-surface bright yellow, excepting at the sides, thighs, and under tail-coverts, which are black with ovate yellow spots at tips of feathers; under wing-coverts white, dusky at base; flights below blackish externally, ashy-brown internally; bill yellow; feet blackish-green; irides reddish-brown; naked orbital region bright yellow. Female with the bill much shorter and broader than in the male. Hab., "West Africa from the Cameroons to Gaboon." (Shelley.)

G. L. Bates (*The Ibis*, 1904, p. 91) says that he found what he took to be the gristly part of slugs in the stomachs of this species. This is all I have come across respecting the wild life of the bird, but it is probable that it feeds, like other species of its genus, upon fruits, berries, leaves, and insects, that it utters its notes from a dead branch or bush, and it is certain that it must nest in a hole in the branch of a tree and lay white eggs.

An example of this species was purchased for the London Zoological Gardens in July, 1884. It is not mentioned by Russ in his "Fremdländischen Stubenvögel."

In *The Avicultural Magazine* for October, 1909, Major Horsbrugh published an account, illustrated by a coloured plate, of Levaillant's Barbet (*T. cafer*), of which he brought home two specimens.

TOURACOUS (*Musophagidæ*).

It would seem that the Hoatzin (*Opisthocomus*) is the nearest relative to the Touracous, which are also believed to be related to the Cuckoos and Colies. Huxley considered the Hoatzin to approach more nearly to the gallinaceous birds and pigeons than anything else; but, in some respects, he recognised an approach to the Touracous. Garrod decided that the ancestor of the Hoatzin branched off from the parent stem shortly before the true *Gallinæ* first appeared, and about simultaneously with the independent pedigree of the *Cuculidæ* and *Musophagidæ*.

The Touracous are fairly large brightly-coloured fruit-eating birds, confined to the Ethiopian Region; they are arboreal in their habits, but can run rapidly upon

the earth; they nest on a platform built of sticks or twigs, upon which they lay two to three, or even "five," pure white, greenish, or bluish-white eggs.* Their flight is easy and graceful, but probably not sustained.

These birds have short stout bills, usually prominent crests; short and rounded wings, and a long rounded tail, consisting of ten feathers; the feet are short in the shank, and the toes are semi-zygodactyle, the outer toe being capable of movement both backwards and forwards.

One interesting peculiarity of these birds seems to me to be a conclusive answer to those who assert that a feather when once perfected is incapable of change, since the crimson colouring in the feathers of Touracous is soluble in water, leaving the webs pale and washed out in appearance; nevertheless after the feathers have become dry the pigment is gradually replaced. This pigment, which has been called "Turacin," has been proved to contain copper.†

It has been asserted that the Touracous do not differ sexually, and so far as plumage goes this statement is tolerably correct, but a comparison of the beaks of the two sexes shows that the male invariably has a decidedly longer and narrower beak than the female.

Mrs. Johnstone fed her Touracous upon cut-up banana, soaked biscuit squeezed dry, sweet-water grapes, and mealworms, caterpillars, including silkworms, and later bread and milk, not made sloppy. As she was successful in breeding with these birds we may take it that this food is satisfactory.

Senegal Touracou (*Turacus persa*).

Back, body of wing, and tail glossy violet; flights, except the outer one, bright crimson, with black edges and shafts; head, neck, front and centre of chest grass-green; bare ocular patch scarlet, with a band of white feathers in front and below, which is divided on the cheek by a black patch; rest of body below black with a violet shade; under wing-coverts dark brown, partly washed with green; flights below as above; bill deep olive, yellowish on edges; feet black; irides hazel. Female apparently larger, and with shorter, stouter bill. Hab., West Africa, from Senegambia to the Congo.

All we know about the wild life of this species is that it probably corresponds with that of its allies. It is rare in the market, but the London Zoological Society has received a good many examples, the first specimen exhibited in their Gardens having been presented as long ago as 1858. Russ evidently confounds it with some southern species, so that it seems doubtful whether the species received at Amsterdam in 1851, those owned by Baron von Cornely in 1884, etc., were really this species, though it is extremely probable that they were.

Buffon's Touracou (*Turacus buffoni*).

Differs from *T. persa* in having a broad jet-black band below the eye and no white band beneath it, but sometimes a narrow white line. Female with a noticeably shorter bill. Hab., "West Africa from the Congo to Senegal." (Shelley.)

Mr. R. Kemp, in an article on the "Birds of South-eastern Sierra Leone (*The Ibis*, 1905, p. 226) says: "Irides dark hazel; bill dull blood-red; orbit scarlet; feet and claws black. This Touraco probably breeds in May and June, as a hen obtained in the latter month contained in its ovary an almost fully-developed egg."

Captain Shelley ("Catalogue of Birds," Vol. XIX., p. 439) throws some doubt upon the validity of this species; but if his account of the soft parts in *T. persa* is correct, there should be no difficulty in distinguishing the living birds from each other.

T. persa	*T. buffoni.*
Bill deep olive, yellowish on edges.	*Bill* dull blood-red.
Feet black.	*Feet* black.
Irides hazel.	*Irides* dark hazel.
Orbital ring scarlet	*Orbital ring* scarlet.

The totally different colouring of the bill should be amply sufficient to indicate at least a right to subspecific rank for *T. buffoni*. It first reached the London Zoological Gardens in 1862, since which time specimens have been occasionally received up to 1892 at least, as also in the Berlin Gardens.

Schalow's Touracou (*Turacus schalowi*).

Back and body of wing glossy green partially shaded with blue; flights crimson and black as usual; tail violet; head, neck, and chest grass-green; feathers of crest and nape tipped with white; bare orbital skin bright red, bounded in front by a white band from the lores and below by black feathers expanded into a patch across the cheek; behind the latter a second white band extends to beyond the ear-coverts; lower breast and remainder of under parts dusky slate-colour washed with glossy green; bill orange; feet black; irides brown. Female not differentiated, but doubtless with shorter and stouter bill. Hab., "Mossamedes and Benguela to the western shores of Lake Tanganyika" (Shelley); German E. Africa (Neumann).

In Layard's "Birds of South Africa," p. 143, we read: "This beautiful species was first discovered by the Zambesi Exploring Expedition."* "It likewise occurs in South-Western Africa, where Monteiro discovered it in Benguela. He gives the following notes concerning it: "They are sometimes brought to Benguela for sale by the negroes from Bibé. Appears to be much rarer than the *C. erythrolopha*. I have seen both pretty abundantly to the interior of Novo Redondo."

The Zoological Society of London acquired this bird by presentation in 1899, and it was still living in 1901.

Livingstone's Touracou (*Turacus livingstonii*).

Differs from the preceding in its shorter crest and greener tail. Hab., "East Africa from the Ugogo to the Zambesi" (Shelley); Zululand (Woodward).

In the Museum there are sexed examples from Nyassaland, in which the male is more golden-green on the mantle and wings than the female; the feathers of the mantle fringed with gold instead of blue. Oddly enough, in a paper on birds collected in Nyassaland (*The Ibis*, 1893, p. 9), Captain Shelley says: "Twelve specimens of both sexes, showing that they are perfectly alike in plumage."

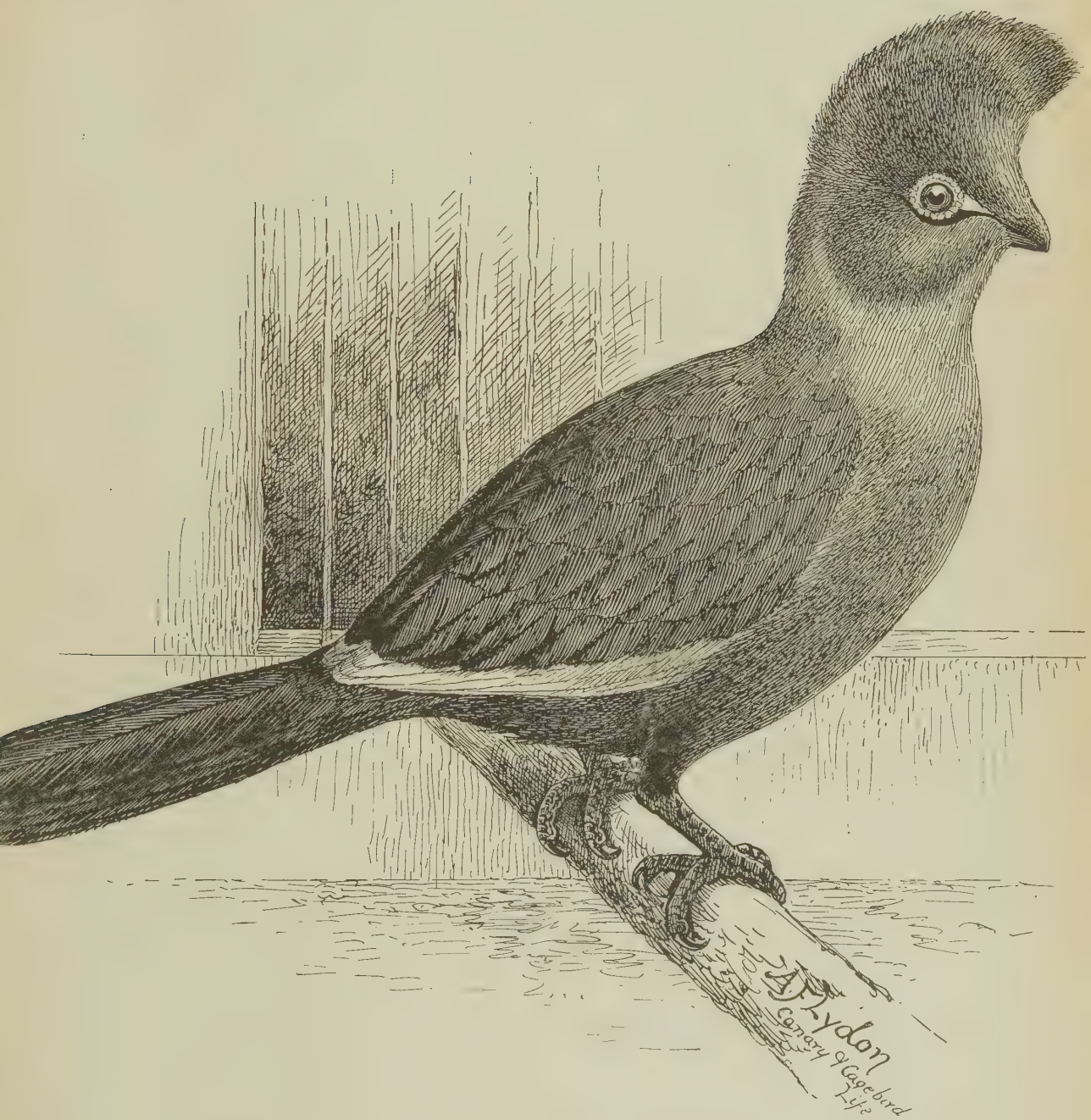
Messrs. R. B. and J. D. S. Woodward (*The Ibis*, 1898, p. 225) say: "We were repaid for our trouble in coming here, as we obtained some very interesting birds, one of which was Livingstone's Plantain-eater (*Turacus livingstonii*), the finest of the three South African Louries. We knew it to be an unusual species by its cry before we shot it; it much resembles *Turacus persa*, but has a taller and more conspicuous crest."

According to Lieut.-Col. W. H. Manning, the native

* Five is a number given by Dr. Stark, but must, I think, be an error; two is certainly the usual number of eggs laid.

† The green plumage contains iron, but not copper.

* He confounds it with *T. livingstonii;* therefore I quote no further respecting this locality.



Senegal Touraco.

name of the Touracou in Nyassaland is "*Ngalukula*." (See *The Ibis*, 1901, p. 592.)

Mr. C. F. M. Swynnerton (*The Ibis*, 1907, pp. 293, 294) says: "This lovely bird is the common Touraco of Chirinda, and is also found in the wooded kloofs and forest-patches of other portions of the district. Its call is a bold crowing '*kurrrr kurrrr-kurrrr*,' several times repeated—harsh, no doubt, but to my mind exhilarating and by no means unpleasant, which may be heard at all times of the day, but particularly towards evening, and to a somewhat less extent in the early morning. It is a somewhat unsociable bird, usually going about in pairs, though sometimes, particularly at the close of the breeding season, as many as four or five individuals—a family party, probably—may be found about one spot, answering one another or crowing in chorus. Again, it is not unusual to see large numbers—a dozen or so—feeding together on the ripe fruit of some large forest-tree; but these merely collect for a common purpose, and, when satisfied, disperse singly or in pairs. In October, 1901, two young birds, just getting their wing-quills, were brought to me; the nest, which I subsequently saw, was a rough flat structure of small sticks, placed about 12ft. from the ground in a small tree standing beside a stream in a kloof. One of these birds, when commencing to fly, abruptly ended its career in a bucket of milk; the survivor lived for two and a half years, becoming extremely tame and a most charming pet. On one occasion it was taken in the night, presumably by a wild cat, the aviary being in bad repair, and feathers and blood on the ground indicated that I should not see it again. What was my surprise later in the day to find Mr. Gwala-gwala on his accustomed perch, minus his tail and a good many other feathers, and somewhat cut about the hinder parts, but as jaunty as ever, having returned of his own accord. I fed the bird chiefly on bananas, but when fruit was scarce it would eat mealie-meal porridge fairly readily, and appeared to thrive on it. Though taking no notice of other birds placed in the same cage while it was still young, I have little doubt that later it would have proved aggressive, for on my showing it a pair of young Purple-crested Touracos, not long before its death, it puffed up its velvety back-feathers, spread its wings and tail, and, leaning forward, crowed loudly several times and attempted to attack them through the bars. It was very fond of water, bathing, in hot weather, several times a day—merely, however, splashing the water over itself a few times and then at once making for a sunny perch, where it drooped its wings and spread out its tail and rump feathers to dry. According to the natives, the eggs of this species are always two in number and pure white. In my tame bird, and in all others which I have examined, the bill and eyelids have been carmine. The length of this bird in the flesh is from 17in. to 18in. The stomachs examined contained wild figs and other fruits, whole or nearly so; I found three-fourths of a wild fig, 1.25 inch in diameter, in one of them."

In *The Ibis* for 1908, p. 416, the same observer gives its Singuni name as "Igwalagwala" and its Chindas name as "Ihurukuru." He says: "I have noticed that these Touracos call most in the morning and evening, particularly the latter. One individual will start the loud quick 'ká-ka-ká-ka-ká' note, half a dozen others will join in, and finally all will end up with a regular chorus of the crowing note—really quite deafening when close at hand."

Two examples of this Touracou were presented to the London Zoological Gardens in 1894; it has also been represented in the Amsterdam Gardens.

White-crested Touracou (*Turacus corythaix*).

Differs from *T. livingstonii* in its shorter and more rounded crest; the back and wings with blue-washed edges to the feathers, the tail bluer; bill orange-brown; feet black; irides brown. Female not differentiated. Hab., South Africa, from the Zambesi to Natal and the Cape Colony. Messrs. Stark and Sclater ("Birds of South Africa," Vol. III., pp. 215, 216) publish the following notes on this species: "This bird, known as the Touraco or Plantain-eater in Europe, as the Lourie in South Africa, is entirely confined to forest districts, where it frequents high trees, seldom descending except during rainy weather; its flight is very light and graceful as it glides from bush to bush, feeding on wild figs and other forest fruits; the old birds are usually seen in pairs, the younger ones in small parties.

"The cry is a loud croaking sound, uttered in early morning and at sundown. At this time they are easily traced, but during the day, when they are silent, it is very difficult to find them. The nest is built like that of a pigeon, of sticks laid horizontally in the centre of a thick bush usually about 10ft. above the ground, and is of the size of a dinner plate; the eggs, five in number, are pure white and of about the same size as those of a tame pigeon, according to Rickard, who found a nest near East London on Jan. 27.

"Perhaps the most interesting peculiarities about this bird (which it shares with most of the other members of the family) is the presence of a peculiar red pigment on the wing-feathers, named by Professor Church ("Phil. Trans.," Vol. CLIX., pp. 627-636, 1870; and Vol. CLXXXIII A., p. 511, 1893), Turacin.

"This pigment is soluble to a certain extent in water and exceedingly so in a soapy (*i.e.*, alkaline) solution, and it has been observed by Verreaux and many others since, that during heavy rains these birds descend from the higher branches of the trees and seek shelter in the lower and thicker undergrowth to avoid the wet, but that notwithstanding this their plumage often becomes so saturated with moisture that they are quite unable to fly, and they can then be caught with the hand. At this time the greater part of the red colouring matter of the wings has become washed out. The same effect can be produced artificially by rubbing the feathers with soapy water, when they can be reduced to a dull white or grey colour. The bird, moreover, has the power of renewing the turacin of the wings, and very shortly after the plumage becomes dry the colour is as brilliant as ever.

"Turacin was carefully analysed by Professor Church, and was found to contain, in addition to the usual carbon, hydrogen, nitrogen, and oxygen, about 7 per cent. of copper, a substance not usually found in organic compounds and never in such large quantities. Many suggestions have been put forward as to whence the bird derives this metal, but it is probable that the presence of small quantities of it in plantains, bananas, and other fruits on which these birds feed is sufficient to account for the matter without having recourse to suppositions about their swallowing grains of malachite and other copper ores, as has been suggested."

Messrs. Alwin Haagner and Robert H. Ivy ("Sketches of South African Bird Life," p. 108) say that the nest of this bird is situated "from 6 feet to 16 feet above the ground," and that it "usually lays two eggs of a pure white colour, and rounded oval in shape." Their account is illustrated by an excellent photogravure of the nest *in situ*, with the two eggs and bird.

The Messrs. Woodward, in their article on the "Birds of St. Lucia Lake, Zululand (*The Ibis*, 1900, pp. 519,

520), say: "These Touracous are common here, their hoarse croaking being constantly heard in the thick bush. The nest is built in the top of a tree, and is not often found. It is made of sticks, and the eggs are white. We noticed that the birds shot after rain had lost much of the brilliancy of the carmine colour of the wing-feathers, but apparently the colour returns after the weather gets dry again."

In *The Ibis* for 1904, p. 107, Mr. G. C. Shortridge says of a male bird: "Iris hazel; bill red; legs black. In the stomach, berries." And of a female: "Iris dark brown. In the stomach, wild figs." It would be interesting to ascertain whether this is a constant sexual difference, since we know that in many Parrots the colouring of the iris differs sexually. This species was first purchased for the London Zoological Gardens in May, 1870, since when the Society has acquired several other specimens; it has also got into private hands, and in *The Avicultural Magazine*, Second Series, Vol. VI., pp. 297, 298, the Rev. Hubert D. Astley, who secured four examples in 1907, has published an account (illustrated by the plate from Messrs. Haagner and Ivy's book) of the nesting of a pair in his aviaries. He says that he feeds his birds on "boiled rice, potato and carrot, with strawberries, cherries, grapes, banana, and sometimes melon."

Great-billed, or Fraser's, Touracou (*Turacus macrorhynchus*).

Above, mantle, body of wing, and upper tail-coverts glossy violet-blue, varied with metallic green; flights, as usual, crimson and black; lower back blacker and less glossy than the mantle; tail glossy greenish violaceous, more greenish than the mantle; head, neck, and front of chest grass-green, which colour shades into blood-red on the terminal half of the crest and the back of neck, but the longer crest-feathers almost deepening to black; feathers of hind-crest and nape white-tipped; naked orbital patch red, bounded in front by a broad white band extending to the bill, and below by a small patch of black feathers on the cheek; behind the latter a broad white band extending to below the ear-coverts; back of chest and remainder of under parts dusky black, partly glossed with green; bill orange, olivaceous towards the nostrils; feet black; irides brown. Female apparently slightly larger than the male, and doubtless with a stouter bill. Hab., "East Africa south of the Equator, between Kilimanjaro and Zanzibar." (Shelley.)

Captain B. Alexander says (*The Ibis*, 1902, p. 362): "In the adult male the upper mandible is yellow, orange at the lower part of the base, the lower mandible red, the iris bluish-black; the eyelids are coral, and the legs and feet black." Russ says: "It is but rarely imported alive. It first arrived at the Zoological Gardens of Amsterdam in the year 1854, and in the years 1865 and 1866 it came to the Berlin Gardens." He says nothing about the London Gardens, which also received it in the same years, and again subsequently—certainly up to 1890, if not later.

In *The Avicultural Magazine*, Second Series, Vol. III., pp. 26-29, Mrs. Johnstone published an interesting account of the nesting of this species in her aviaries. Unhappily, on this occasion the single young one hatched was not reared; it, however, afforded the material for a very important paper on the pterylosis of the young Touracou by Mr. W. P. Pycraft (*t.c.* pp. 55-63). Undeterred by her lack of success in 1904, Mrs. Johnstone put up the birds again in the following year, and in *The Magazine* for 1906-7 (Vol. V., pp. 87-90) she has given a full account of the successful nesting of this species in an outdoor aviary. One young one was reared.

From what Mrs. Johnstone says, there can be little doubt that the Touracous in their wild state must, to some extent, feed upon insects as well as fruit, like other frugivorous birds.

Red-crested Touracou (*Turacus erythrolophus*).

Above with mantle and metallic part of wings golden green; back dull blue, partly glossed with golden green; upper tail-coverts and tail purplish-blue; upper part of head and nape blood-red, darkest at ends of nuchal feathers; longer feathers of crest white-tipped; sides of head and chin white, shading into grass-green on throat, neck, and front of chest; rest of body dull slate-colour slightly glossed with green; bill yellow, olivaceous towards nostrils; feet black; irides brown; bare orbital ring probably red. Female not differentiated, but doubtless with a broader bill. Hab., West Africa, from Sierra Leone to Angola.

Monteiro met with this species "pretty abundantly to the interior of Novo Redondo" (*vide* Sharpe and Layard, "Birds of S. Africa," p. 143). According to Russ, this species rarely appears in the German bird market. It reached the London Zoological Gardens in 1878, and those of Amsterdam in 1887.

Purple-crested Touracou (*Gallirex porphyreolophus*).

Above with mantle and wing-coverts blue, changing to green towards neck and on least coverts; remainder of metallic part of wings, upper tail-coverts, and tail greenish-blue; primaries crimson and black, as in *Turacus;* remainder of back dull greenish-blue; forehead, sides of head, lores, chin, and upper neck metallic green, changing to glossy violaceous blue on crest and nape; remainder of under surface smoky ash, deeper and partly glossed with green on under tail-coverts; bill and feet black; eyelids scarlet; irides dark brown. Female not differentiated. Hab., "South Africa, from the Zambesi through Natal to the Knysna in Cape Colony." (Shelley.)

Messrs. Stark and Sclater say ("Birds of South Africa," Vol. III., pp. 218, 219): "The Purple Lourie is common in the dense bush along the sea coast of Natal, but retreats inland for about fifteen miles, according to Ayres, in the spring, returning during the summer, autumn, and winter, to the coast. Several birds are often to be seen together, hopping and climbing about among the branches of the larger trees, and playing antics with one another, depressing and expanding their tails and displaying the rich crimson of their wings. They have a loud and harsh voice, compared by Shelley to the name often applied to them, 'Tourakoo,' generally heard at early morning and in the evening. The food consists of hard, nutty berries and small fruits, which are swallowed whole."

Mr. C. F. M. Swynnerton (*The Ibis*, 1907, pp. 294-296) publishes the following valuable notes on this species:—"This is the Touraco of the open woods, and is particularly fond of the large trees and clumps of dense bush growing on ant-heaps; it may often be seen flying from clump to clump, and traversing each with three or four long hops before proceeding to the next. I have never found it in the forest. It is a bold and strikingly-coloured bird, but quite lacks the grace and soft beauty of the preceding species (Livingstone's Touracou). Two young birds were brought to me by a native in February, 1905; he stated that the nest was placed in a bush, ten or twelve feet from the ground, and resembled that of a Dove, and that two was the usual number of the clutch. One of these fledglings has survived, having been kept till recently in a large aviary with a number of other birds, towards which, however,

it has become very aggressive. It is extremely inquisitive, and its curiosity appeared to be first aroused by the metallic spots on the wings of the Tympanistrias; these it attacked, plucking out the coloured feathers, and, on finding out that no resistance was made, proceeded to completely strip the backs of its victims, and to attack the Haplopelias. It has thus from time to time killed a good many of the Doves, apparently out of sheer exuberance of spirits, for it never attempts to eat either the feathers or the birds themselves. Just after sunset it becomes particularly lively and aggressive, taking long hops from perch to perch, crowing, and giving a peck here and a peck there to each of the Doves, already sleepy and settling down for the night, as it passes; then it returns, never assailing any individual persistently, but finally sometimes felling one by dint of repeated attacks, for they merely sit still and cower. When one falls to the ground the Touraco descends, gives it the *coup-de-grâce*, in the form of two or three sharp blows on the back of the head, and then resumes its sport. It never attacks the Roller, the Parrot, or the Bulbuls, having found probably that these birds resent its first attempts in that direction. It feeds readily from the hand, and, after a meal, retires to some higher branch, and there sits, puffed out and lethargic, with its head well down between its shoulders, making a continual slight rasping noise, comparable perhaps to snoring, for half an hour or more; when in this condition it greatly enjoys having its breast stroked. Not infrequently it will eat a few small grasshoppers, but it is clumsy with regard to the larger locusts, going about and bruising them on the branches somewhat after the manner of an insectivorous bird, but usually letting them drop after a few seconds. When annoyed, or hungry and excited by the sight of food, it will utter a loud, quick '*ká-ka-ká-ka-ká!*' a note common to both Touracos, and frequently heard in the forest. It is exceedingly tame, but when outside the aviary will not come to the hand so readily as would my *T. livingstonii*, seeming to take an impudent delight in teasing its pursuer. Its running powers are remarkable. Being at large on one occasion when I had to leave home for a few days, it had to be captured, and when, after a long chase amongst the gum trees, it took to the ground—cultivated, but bare—it ran, apparently not thinking of flight, for a distance of more than two hundred yards before I myself and seven Kafirs, close on its heels from the start, could secure it; it was then considerably exhausted. This Touraco may frequently be seen running along the horizontal branches of large trees, but its speed on this occasion, and the distance covered, were a revelation to me. The natives believe that, should a Touraco fly across the road and call, it indicates that they will find a buck or a beer-drink on ahead; its crimson wing-quills are greatly prized by them, and in former times used to be reserved for the king."

Although, strangely enough, this species is omitted from the "List of animals now or lately living in the Gardens of the Zoological Society of London," we read in the Proceedings of that Society for 1879, p. 218: "A Purple-crested Touracou (*Corythaix porphyreolopha*), presented by the Rev. J. A. Gould, F.Z.S., February 4th.

"On his return from Natal, Mr. Gould was kind enough to bring us the first example of this beautiful Touracou which has been received alive by the Society. The bird was obtained from a person on board the Zanzibar mail steamer, and is doubtless from Mozambique or from some part of the East African coast." The species has also been represented in the Amsterdam Gardens.

Green-necked Touracou (*Gallirex chlorochlamys*).

Differs from the preceding species in the uniform colouring of the grass-green portions of the plumage, which show no trace of pink shading; it is also a trifle smaller. Hab., Eastern Africa north of the Zambesi and extending to Abyssinia.

According to Mr. F. J. Jackson (*The Ibis*, 1892, p. 313), the bill and feet black and the eyelids coral-red, so that in its soft parts this form does not appear to differ from the southern race.

According to Fischer, "at Máurui at the Pangani it inhabits the densest portions of the forest on the banks in flights of from four to twelve individuals; they exhibited a very lively, restless demeanour, hopping from twig to twig and chasing one another without intermission in the tops of the trees, sometimes depressing, sometimes erecting their crests, and uttering a short growling note which sounded like 'korro.'"

According to Dr. Böhm, "this species keeps chiefly to the thicket of trees smothered with luxuriant parasitic climbers, but betrays itself here by its loud voice, which may be rendered by the deep and rapidly-jerked-out syllables, ku-kulluck, ku-kulluck, ku, ku, ku, ku. It stays nowhere long, flutters much more up and down, flips actively with its tail, shakes itself, erects and droops the feathers on its head. The flight is rapid, easy, and gliding. The birds are shy, and as soon as they think they are being followed, endeavour to glide away into the nearest thicket as easily and imperceptibly as possible." (cf. Russ "Die Fremdländischen Stubenvögel, Vol. II., p. 674).

In 1889 a specimen of this bird was presented to the London Zoological Gardens by Miss Dolly Kirk; three years later a second, from British East Africa, was presented, and in 1894 two more from British Central Africa. In 1895 the Berlin Gardens secured an example, and Mr. Meusel observed that when the bird washed the wing-feathers lost their colouring and the water became greenish.

Violaceous Touracou (*Musophaga violacea*).

General colour glossy violaceous blue, duller and darker on lower back, abdomen, thighs, under tail and wing coverts; flights coloured crimson and black, much as in *Turacus*; crown and nape crimson, the feathers short and somewhat hair-like; orbital patch extending to bill scarlet; beneath the posterior half of the latter a white band extends under the ear-coverts; lower throat and fore-chest glossed with green; bill orange-red (or chrome-yellow), fading to yellow on anterior half of upper mandible; feet black; irides brown. Female not differentiated. Hab., West Africa from the Cameroons to Senegambia.

Ussher met with this species in small companies, but Reichenow says that in the marshy lands of the Cameroon river he only observed it singly or in pairs. "They affected low, dense scrub on the borders of the forest rather than high trees. They keep hidden away, and I have never heard a sound from them. They merit the name of Pisang or Banana-eater as little as the other members of the family, indeed not one of them feeds upon fruits of that kind." (cf. Russ, "Die Fremdlänischen Stubenvögel," Vol. II., p. 669.)

Capt. B. Alexander (*The Ibis*, 1902, p. 362) says: "This species haunts the vicinity of streams and is generally observed in pairs. The male in the nesting season, which is in April, utters a turkey-like gobble."

First exhibited at the London Zoological Gardens in 1863, since which time many examples have found a home there, the last recorded in the ninth edition of

the list being two specimens purchased in 1891. It reached the Amsterdam Gardens in 1852, and those of Berlin in 1863, since when it has come to hand from time to time.

VARIEGATED TOURACOU (*Schizorhis africana*).

Above with back of neck, mantle, and wing-coverts ashy-grey, the feathers mostly with dark brown shaft-stripes expanding into subterminal spots; bastard wing, outer greater coverts, and flights black; primaries with their inner webs largely white towards base; back and upper tail-coverts browner than mantle, with dark brown shaft-stripes; tail black, passing into ashy-brown on greater part of central feathers and towards base of approximate feathers; head, including chin and throat, dark brown mottled with white on front of crown and sides; crest-feathers with narrow white edges; feathers at back of throat white-edged; remainder of under parts white with narrow dark brown shaft-stripes; bill yellow; feet and irides dark brown. Female slightly smaller, and doubtless with broader bill. Hab., "West Africa, from the Niger to Senegambia, and inland to Stanley Pool on the Congo." (Shelley.)

Captain B. Alexander says (*The Ibis*, 1902, p. 362): "This species inhabits open, tree-grown country, and is generally found in pairs. It always selects the topmost boughs of a tree on which to alight."

The London Zoological Society first secured this bird in 1863, in 1866 they purchased a second, and in 1873 they received two in exchange. Russ does not say whether it has appeared in any of the Continental gardens, but observes, "It rarely comes into our market."

This brings me to the end of the Picarian birds, next to which we have to consider the popular Psittacine forms; not that I personally take especial delight in them—on the contrary, I would rather take up the study of almost any other group of cage-birds; they are such risky creatures to handle, and in many cases so treacherous and vindictive that they do not appeal to me. Of course, there are exceptions, and for their sake I would not condemn the whole order; besides, even if the gaudy colouring of Parrots is sometimes inartistic and even vulgar, the capacity which many possess of learning to talk renders them amusing pets.

CHAPTER VIII.

ORDER III.—PSITTACI.

These birds are generally admitted to be allied to the Birds of Prey, to which the great, strongly-hooked upper mandible and basal cere give them some resemblance; certainly the taste which the Kea has acquired for fat torn from the kidneys of living sheep seems to point to a predatory instinct inherited from some Hawk-like ancestor. I remember my friend Mr. F. W. Frohawk, who possessed one of these birds for a considerable time, saying that it seemed more like a Buzzard than a Parrot. In their scansorial habits, zygodactyle feet, usually arboreal life, and gaudy colours, their habit of nesting in holes and laying white eggs, they seem to show relationship to some of the Picarian groups, while the dilatation of the œsophagus, which secretes a milky fluid, reminds one of the *Columbæ*. The highly-developed brain, which led some naturalists to regard them as having a claim to be placed at the head of the birds, the large, fleshy tongue and the conformation of the larynx, which render mimicry of the human voice and many other sounds easy to these birds, and the movable upper mandible, represent a combination of characters distinguishing the Parrots from all other orders. If you soften a Parrot's skull and raise the upper mandible, you will see a beautiful mechanism at work—a sort of piston-rod moving backwards and forwards in relation to the position of the mandible.

Most of the species lay in holes in trees, very few making any nest; the eggs are white, like those of Doves; the young are born naked, and are fed from the crop.

Count Salvadori divides the Parrots into six families:

1. *Nestoridæ*, represented by the Ka-ka Parrots, very ugly and rarely imported birds, with long and fairly slender beaks; the family consists of one genus, and is confined to the New Zealand sub-region.

2. *Loriidæ*, including the Lories and Lorikeets, occurring in Australia and Polynesia.

3. *Cyclopsittacidæ*, a group of Lorikeets confined to the Austro-Malayan sub-region.

4. *Cacatuidæ*, or Cockatoos and Cockatiels, extending over the Australian region and the Philippine Islands.

5. *Psittacidæ*, occurring over a very extensive area both of the Old and New Worlds, and including the Macaws, Conures, Parrakeets, true Parrots, and Love-birds.

6. *Stringopidæ*, containing the singular Night Parrot of New Zealand.

In captivity the parrots require different treatment according to the group to which they belong; their food in a wild state differs so greatly that to attempt to provide a general food for the whole Order is just as hopelessly absurd as it would be to make up a mixture for the universal diet of the whole of the Mammalia. In these birds, therefore, I shall deal with the question of food under each group separately.

KA-KAS (*Nestoridæ*).

In these birds the beak is long and comparatively slender with grooved culmen, the hook almost smooth below or very slightly ridged longitudinally; the lower mandible extended, without the usual angle or abrupt curve, but with an almost straight curvature towards the tip; tongue fringed.

The sexes differ in the size and outline of their beaks.

In captivity these birds should be fed, according to Frohawk, upon carrots, swedes, potato, any kind of fruit, dog-biscuit, nuts, bones, either raw or cooked (which it greatly enjoyed); "it also caught, skinned, and ate mice; in fact, anything seemed to suit it."

KEA OR MOUNTAIN KA-KA (*Nestor notabilis*).

Dull olive-green with black edges to the feathers; flights dusky-brown; outer web of primaries bluish; inner web dentated with lemon-yellow; outer web of secondaries greenish-blue, inner web dentated with orange-red; rump and upper wing-coverts washed towards tips with orange-red; tail bluish-olive, belted near extremity with blackish-brown; inner webs of feathers dentated with bright lemon-yellow; ear-coverts dusky; under wing-coverts and axillaries orange-red; bill greyish-brown; feet yellowish-olive; irides black. Female duller and with broader dusky borders to the feathers. Hab., South Island, New Zealand.

This species was discovered in 1856 by Mr. Walter Mantell in the higher mountain ranges of the South Island. In its wild state it feeds upon fruits, seeds, and

the larvæ of wood-boring insects, but it also eats carrion, and has developed, within comparatively recent times, the objectionable practice, when driven by hunger during the winter, of attacking sheep, tearing them open so as to get at the fat about the kidneys. As to the amount of mischief done in the destruction of sheep by this Hawk-like Parrot there has been much discussion; but that sheep-owners have a genuine case against the bird can no longer be called in question since the publication of Mr. George R. Marriner's article, read before the Philosophical Institute of Canterbury, N.Z., in 1906, in which he describes the method of attack: "A Kea will settle on the ground amongst the sheep, and after hopping round one of the animals will jump on to its back and commence to tear away the wool. The sheep becomes frightened, and dashes away, but the Kea holds on tightly, or releases its hold only to fly after the animal and settle again immediately the sheep thinks it has shaken off its enemy.

"Having torn off the wool the Kea commences to dig its sharp bill into the flesh of the animal, which after rushing about frantically for some time generally lies down with neck stretched out in a helpless condition, when the Kea, which by this time has probably been joined by several others, continues to tear away the flesh and greedily devour the fat. The attack is generally made in the early morning or late evening, or on foggy days, and only those flocks which are kept in the mountainous districts, where the Keas have their home, are in danger from these birds." (cf. *The Avicultural Magazine*, Second Series, Vol. V., p. 76.)

Because this Parrot has acquired the above abominable habit there seems no reason why in captivity, where more natural food can be supplied, it should be provided with mutton chops as part of its daily diet, as has (I am told) sometimes been done.

In *The Weekly Press*, Christchurch, N.Z., for Feb. 26, 1908, Mr. Edgar F. Stead has published an account of his experiences in trapping the Kea, which has been reprinted in *The Avicultural Magazine*, Second Series, Vol. VI., pp. 281-286. In this article he describes a nest which he found as follows: "We heard the female call away down in the bottom of a big rock slip, and I caught a glimpse of her as she moved. Hurrying to the spot, we found a lot of loose feathers and droppings, which indicated the presence of a nest. We soon located it, in a long hole, the entrance of which was formed by two enormous boulders, which leaned one against the other, forming a triangular space, partly blocked by a third stone. This latter we removed by using a thick vine as a rope, and after much scratching and scraping I reached in, and, striking a match, saw the bird on her nest. More scraping and digging among the small stones and earth, and then I reached in, but quickly withdrew my hand, minus a small piece of the middle finger. I then wrapped a handkerchief round my hand, and very soon had the bird out. I handed her to Mr. Murchison to hold, and she immediately took a piece out of his coat and clawed him pretty thoroughly, but my attention was on the nest, and to my joy I found four pure white eggs. They were laid on the ground among a few chips of rotten wood and bark, about 5ft. from the entrance of the hole."

The first specimen of this bird to reach the London Zoological Gardens was presented in 1872 by the Acclimatisation Society of Canterbury, N.Z. Since that date many specimens have been exhibited in our Gardens, the last two mentioned in the ninth edition of the Society's List having been presented in 1892. In 1882 Miss Hagenbeck exhibited one at a bird show in Berlin; but it seems to have been always rare in the German market, whereas in England several private aviculturists have possessed it.*

Common Ka-ka (*Nestor meridionalis*).

Above olive-brown with dark brown margins; feathers of neck tipped with three semicircles—dull red, orange, and brown; wing and tail-feathers olive, paler at margins and tips; inner webs of flights dentated with pale salmon-red; rump and upper tail-coverts dark red; tail-feathers dentated with red on inner webs; crown, nape, cheeks, and throat hoary bordered with brown, the former slightly tinged with bluish, and the feathers at base of bill washed with red; ear-coverts streaked with dull orange and brown; breast olive, each feather with a narrow subterminal brown crescent followed by a reddish-orange one; abdomen and under tail-coverts dark red; under wing-coverts scarlet, crossed by narrow black bands; bill dark bluish-grey; feet bluish-grey, the soles yellowish-brown; irides dark brown. Female with much smaller beak, the terminal hook less curved. Hab., New Zealand.

According to Julius Haast (cf. Gould, "Handbook to the Birds of Australia," Vol. II., p. 549) "The noisy Ka-ka plays a conspicuous *rôle* in the forest. It is a gregarious bird, perching generally on the highest trees. but, as soon as the assembled flock hear a noise unknown to them, they approach and amuse the traveller by their various quarrelsome notes and shrieks. If in shooting at them one only be wounded so that it may be secured, it is an easy matter to shoot one after the other, as they always come back when they hear the cry of a wounded companion."

"If surprised by a dog the Ka-ka becomes a respectable opponent, for with outstretched wings he throws himself on his back, and defends himself stoutly with bill and claws."

Mr. W. W. Smith (*The Ibis*, 1893, p. 514) says that the stately and melliferous flowers of the flax yield a rich supply of food to the Ka-ka Parrot (*Nestor meridionalis*) in the summer months. "It is very interesting to watch these birds flying from flower to flower and licking up the nectar with their brush-like tongues."

Mr. Richard Henry, of Resolution Island, says (cf. *The Ibis*, 1905, pp. 581-582: "I have often found nests of the Ka-ka Parrot in hollow trees, not far from the ground. There are generally four pure white eggs, but I think the parents seldom rear more than two young ones. Sometimes they have young ones in November and sometimes in April. I do not know which is their favourite breeding season.

"Their staple food consists of grubs (which they cut out of partly decayed timber) varied with berries, and with honey which they lick out of the Rata-blossom in summer, and kernels of Miro-stones in autumn.

"They cut grubs out of a withering *Panax* in such a way that it shows they must have reasoning powers, and a distinct knowledge of the relationship between cause and effect. I have often tried to find the grub that was killing the branch, but I usually have to do twice as much cutting as a Ka-ka could do without finding it.

"Last April I took two young ones as pets, and when the parents saw me leaving the nest they went to it at once, and, understanding that I had taken their young, followed me down to the boat screaming their loudest for assistance. This attracted all the Ka-kas

* Mr. F. W. Frohawk says that his bird enjoyed a big bath, after taking which it looked "something like this," and he sends a sketch of a veritable scarecrow.

within hearing, and they made a great demonstration of sympathy. They often do the same in response to the call of a wounded one, and the shooter may then kill a large number without difficulty.

"They make splendid pets, but are very difficult to feed when young—when a fruit-stone the size of a pea will kill them. They have a greater variety of notes and calls than any other bird met with in this locality.

"When an old Ka-ka is eating a ripe Miro-berry he rejects the skin and only licks out the little bit of fruit between it and the stone. I think that they also break the stones for sake of the little oily kernels, but I am not quite sure of this.* All the stones are broken, and the Ka-kas have a substance like the kernels in their crops. The stones are terribly hard to break, but the rats can break them. Ka-kas also cast up the skins of the big wood-grubs, which look like dry bits of tissue-paper.

"After my pets were able to fly one of them was killed by a Hawk. I heard the scream of distress, and went to see what was the matter. Several old Ka-kas also came to the rescue, and one of them followed the Hawk about through the trees, while others tried to intercept him, but they were not nearly smart enough.

"Many New Zealand trees and shrubs are very erratic seed-producers. In some seasons all berries are scarce, while in others some are plentiful and some are absent; yet the Ka-kas and Katapos seem to know beforehand when there will be plenty to feed their young ones and to hatch them at the right time.

"It often happens that the female has a much lighter-coloured head than the male, but no two of them are exactly the same."

The London Zoological Gardens first acquired this species in 1863, and in 1867 they added two others by presentation. It also reached the gardens of Amsterdam and Hamburg, and Russ says that of late a good many have been imported.

LORIES AND LORIKEETS (*Loriidæ*).

In the Lories and Lorikeets the tongue is furnished with a kind of brush; the tail is rarely longer than the wings, which are acute, with the three first primaries generally longest. In their wild state these birds are gregarious, feeding upon fruit, honey, pollen, unripe seeds, and the buds of trees. In captivity Mr. Seth-Smith and others recommend milk-sop (slightly sweetened), ripe fruit, and canary, hemp and millet. On the other hand, Mr. E. J. Brook expressed dissatisfaction with this food, which seemed to have caused the death of some of his birds; an examination of the excreta revealed alkali and some specks of very acid undigested milk curd. A combination of Mellins' food with boiled milk proved satisfactory as a corrective, but oranges, as fruit for these birds, were found to be objectionable; peptonising the milk with Fairchild's peptonising powders was found beneficial (cf. *The Avicultural Magazine*, Second Series, Vol. VI., pp. 85, 86). Later on Mr. Brook found that equal parts of milk, barley-water, and pure water poured on powdered plain biscuit, and then boiled and sweetened, answered admirably.

Never having personally kept these birds, I am aware that my opinion respecting a food for them can have little weight, but the Hon. and Rev. Canon Dutton says that a food which he has always found perfectly satisfactory consists of a mixture of dried fig and bun. Boiling water is poured over each, then the fig is mashed up with double the quantity of bun. If this is a satisfactory food I fail to see why stewed apple mashed up with sponge-cake should not answer equally well; it would do away altogether with the risks of indigestion, which must exist when a bird swallows milk and acid fruits as its regular articles of food. I cannot believe that so utterly unnatural a food as milk can be good for any Parrot, and I have had adundant evidence, since the infirmities of these birds have been repeatedly brought to my notice, week after week, since December, 1898, that for all birds of this order, excepting the Honey-eaters, it is extremely injurious.

* "I have just found out that the Kakas do break the Miro-stones—when they are green, at all events. They are broken fairly in two, crosswise."

Black Lory (*Chalcopsittacus ater*).

Purplish-black; rump, upper and under tail-coverts deep purplish-blue; tail above greyish-purple, changing to greyish olive towards tip, below dark red towards base, golden olive at tip; bill, cere, and feet black; irides maroon, with an inner white ring. Female not differentiated. Hab., "Western New Guinea, from Dorei-Hum and Has (Beccari) to Sorong; Salwatty, Batanta; perhaps also Waigiou." (Salvadori). Dr. Guillemard ("Proceedings of the Zoological Society," 1885, p. 622) says: "Iris, inner ring yellow, outer red; bill and feet black." "This species was abundant in Mysol, in flocks of from ten to twenty individuals. One that lived in confinement on board the 'Marchesa' for some months became excessively tame."

I can discover no further notes respecting the living bird. An example reached the London Zoological Gardens in March, 1905, probably from Mrs. Johnstone, who described it in *The Avicultural Magazine*, Second Series, Vol. III., pp. 147-149.

Red-fronted Lory (*Chalcopsittacus scintillatus*).

Green; back of neck, lower back and rump brighter, but bluer; upper back, breast, and abdomen streaked with yellow; tail with basal half of inner webs red; forehead, lores, and upper cheeks red; crown, sides of head and chin black; throat and sides of breast washed with red, breast dark green, the shaft-streaks orange-yellow; tibiæ and under wing-coverts red; flights below dusky, yellow towards base; tail below with yellowish olive tip; bill, cere, and feet black; irides orange-yellow. Female with much narrower beak, having a longer terminal hook; top of head distinctly duller than in the male. Hab., Western New Guinea; Aru Islands.

I can discover no notes respecting the wild life of this species; it reached the London Zoological Gardens in November, 1872, and, on his return from New Guinea in 1907, Mr. Walter Goodfellow brought home a pair, which also found their way to the London Gardens. It is possible that others may have been imported, but if so the late Dr. Russ appears to have been unaware of the fact.

Blue-streaked Lory (*Eos reticulata*).

General colour red, mottled with darker red on underparts; hind neck and interscapular region streaked with blue; scapulars black, edged with red externally; lesser and median wing-coverts with concealed black bases; greater coverts black, tipped with red; primaries black, red at base of inner webs; secondaries red, tipped with black; rump and upper tail-coverts streaked with dull purple; tail black, slightly tinged with purple; inner web of lateral feathers red; under surface of tail red, with outer webs of lateral feathers golden-olive; bill scarlet, tipped with orange; cere, orbital naked patch

and feet black; irides rich brown. Female with longer beak, more slender towards tip, and with narrower terminal hook; head duller in colouring. Hab., Tenimber Islands. Introduced into Dammer and Tocal Islands (Kühn). I have not discovered any notes respecting the wild life of this Lory. Specimens were purchased for the London Zoological Gardens in 1862 and 1874. According to Russ it is very rarely imported, but nevertheless Dr. Paten brought home sixteen examples. It is said to have a sharply metallic voice according to Scheuda; does not scream, but has a pleasing whistled note, is lively and enduring, according to Dr. Frenzel.

Blue-tailed Lory (*Eos histrio*).

Red; the scapulars, tips of upper wing-coverts and flights black, with the exception of the base of the inner webs of the later; the interscapular region blue; tail above purple, with the exception of the inner webs of the lateral feathers; vertex, ear-coverts, nape, and breast blue; flanks and vent purplish-blue; under tail-coverts red, tipped with blue; beak orange-red; feet blackish; irides amber-red. Female with stouter beak, but with a longer terminal hook to upper mandible. Hab., "Sanghir and Talaut Islands" (Salvadori).

Hickson, in his "Naturalist in North Celebes," p. 155, says that "at Salibabu, one of the Talaut Islands, the brilliant little red and blue Lory (*Eos indica**) was found to be abundant, and numerous living specimens were obtained from the natives" (cf. *The Ibis*, 1890, p. 249).

According to Dr. Meyer, who obtained a specimen of this bird from a friend, these birds "are never dull and sulky, like the Cockatoos, but lively, active, charming and lovable"; "they learn to speak, but never as well as the Cockatoos and Eclecti." Mr. Scheuba, on the other hand, considered them dull, silent, nervous, and easily frightened. (cf. Greene, "Parrots in Captivity," Vol. III., p. 54).

The London Zoological Society purchased two specimens in 1871, and one in 1872, but they did not long survive. According to Russ, who adopted the trivial name "Blue-breasted Lory," first used also in the Zoological Society's earlier lists, says that it was known long ago, but is rare in the market; its price is high, but not fixed! An unnecessary remark, because everyone is aware that the price of all birds depends upon the number in the market.

Red Lory (*Eos rubra*).

Its prevailing colour is bright scarlet, but the outer webs of the first four flights are black, the remainder with black tips, and the last three or four black with bluish tips, the longest scapulars and a band from the thighs to the under tail-coverts, as well as these coverts themselves, blue; the tail below orange-vermilion, the bases of the inner webs of the feathers bright red; beak red, the cere blackish-grey, feet blackish-grey, the claws black; eyes varying from brown to orange, the naked skin blackish. Female with the beak narrower at the base and the culmen less arched.

In young birds the feathers of the under-surface are edged more or less prominently with blue, and the under tail-coverts are red ringed with purple. Hab., Southern Moluccas.

I have been unable to get together any notes upon the wild life of this species. Doubtless it resembles other Lories in being gregarious, feeding upon soft fruit, and buds, nectar of flowers, and insects. For a cage-bird Dr. Russ gives it an excellent character. He says that as a talker it is gifted, picking up new words and even sentences with ease; that it is playful, confiding, tame, and lovable. According to the Hon. Walter Rothschild, the tail and scapulars of specimens kept in captivity are sometimes distinctly greenish. (cf. *The Ibis*, 1900, p. 191).

This species was first exhibited in the London Zoological Society's Gardens in 1874, since which time several other examples have been acquired for the Regent's Park collection. Russ speaks of it as very rare, but says that Dr. Platen brought home seven specimens.

Violet-necked Lory (*Eos riciniata*).

Red; longest scapularies and some of the inner flights dull purple; primaries black, red at base of inner webs; secondaries mostly red, tipped with black; tail above dull purplish-red; back of head, nape, a collar round neck, abdomen and under tail-coverts purple; tail below red at base of inner webs, yellowish-red with golden reflections towards tips; beak orange-red; feet blackish-grey; irides dark or reddish-brown; orbital naked region yellowish-grey. Female with the base of the beak narrower and the culmen less arched. Hab., Halmaheira group of islands.

Dr. Guillemard ("Proceedings of the Zoological Society," 1885, p. 564) describes the soft parts as follows: "Iris yellow; bill dull red, yellow at tip; tarsus dull grey."

Russ says that this is one of the very rarest in the market; yet Mr. Frank Finn, in a paper on the cage-birds of Calcutta (*The Ibis*, 1901, p. 439) says: "*Eos riciniata* is, perhaps, the most abundant." There seems, therefore, no reason why it should be especially rare in the European market. It was first purchased for the London Zoological Gardens in 1873, and others have been added to the same collection in later years.

Whitish-rumped Lory (*Eos fuscata*).

Dull brown; feathers of hind-neck and interscapular region, as well as those of the lower throat edged with reddish, greyish, or olive; primary coverts and anterior greater coverts tinged with purple; innermost greater coverts and inner secondaries tinged with chestnut; primaries slightly tinged with olive on outer edges, their inner webs red at base; lower back and rump yellowish-white; tail above greyish-purple, the central feathers reddish towards the base; vertex of head and a band on the nape reddish-orange; a band across the throat, another across the breast, the middle of the abdomen and the tibiæ, red; tail below red at base of inner webs, reddish-olive towards tips; beak red, or orange-yellow; cere reddish-black; feet black; irides yellow to carmine-red; naked orbital skin black. According to Russ the female differs in having all the red portions replaced by orange or clear yellow; but, according to Salvadori, this is a character which distinguishes the young bird. Hab., "New Guinea, Jobi, Salwatty." (Salvadori.)

Dr. Guillemard describes a male obtained at Andai as having, "Iris, inner ring orange, outer white; bill orange; tarsus black; pectoral bands and abdomen red" ("Proceedings of the Zoological Society," 1885, p. 622).

Russ merely says of this species, "Extremely rare"; he does not say (in his "Handbook") when or by whom it was imported, but leaves it to be inferred that it has been, and for that reason alone I include it.

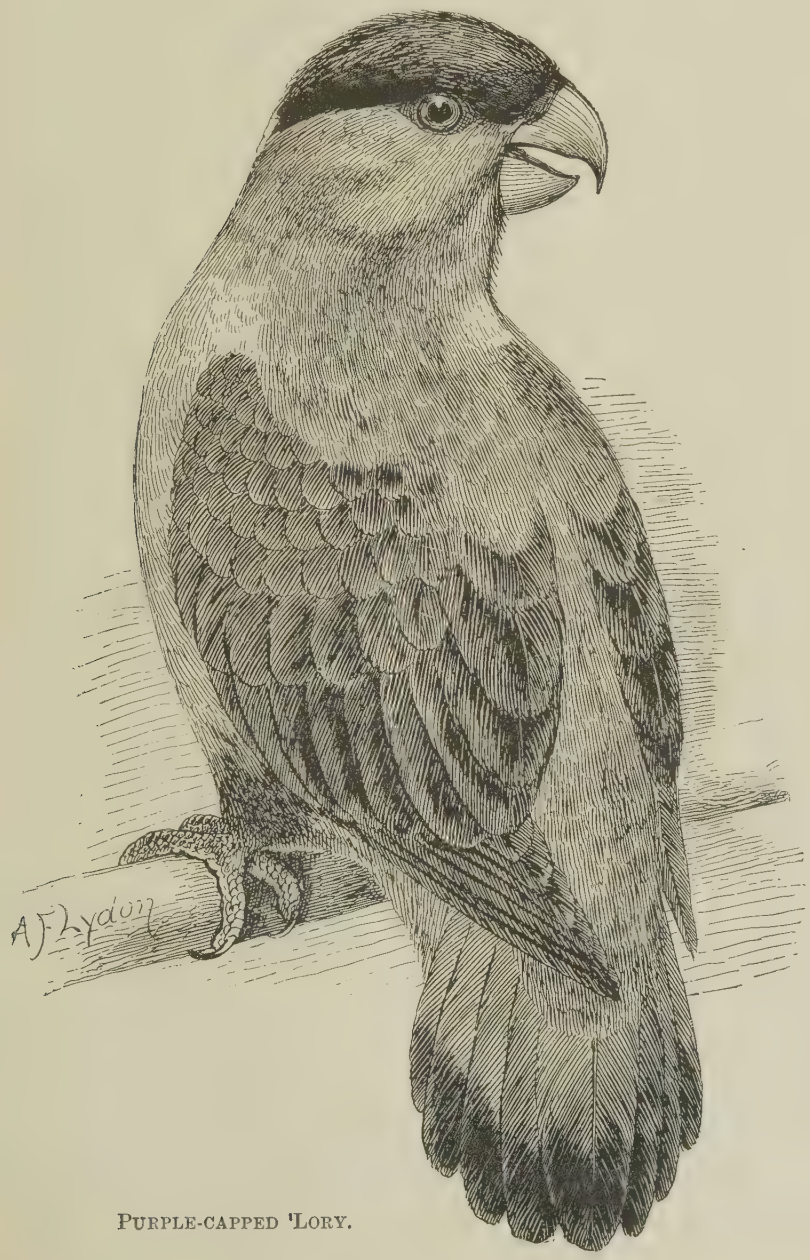
Louisiade Lory (*Lorius hypœnochrous*).

Red; interscapular region crossed by a deep purplish-red band; wings green, flights yellow at base of inner

* A synonym of *E. histrio*.

webs; tail above red towards base, purple tinged with greenish on distal half; crown and back of head black; back of abdomen, tibiæ, and under tail-coverts purple; under wing-coverts and base of tail below red, distal portion golden-olivaceous; beak orange-red; cere yellowish-white; feet blackish; irides scarlet to brown. Female not differentiated. Hab., "Louisiade Archipelago, New Guinea and East Cape, New Ireland, New Britain, and New Hanover." (Salvadori.)

I have been unable to discover any notes on the wild life of this species. In captivity it is said to be lively, excitable, but not nervous; its cry is not a whistle, but rather a hissing, like that of a goose; it is a clever bird. Miss Hagenbeck has imported it on several occasions, and Russ thinks it may have been not infrequently imported and sold as *Lorius lory*.



PURPLE-CAPPED LORY.

THREE-COLOURED LORY (*Lorius lory*).

Red; a paler band below the back of head, and sometimes a second across the interscapular region; back of neck, continuous with the breast, and interscapular region, blue; wings green; some of the coverts and inner flights washed with golden-olivaceous; the base of inner webs of flights yellow; tail above deep red at base, greenish in the middle, deep blue on distal half; crown and back of head black; centre of abdomen, tibiæ, and under tail-coverts bright blue; under wing-coverts red; tail below bright red at base, golden-olivaceous towards tip; beak red; cere dull yellow; feet black; irides yellowish-red to brown. Female rather narrower in the skull, the beak distinctly narrower. Hab., "North-western New Guinea, Salwatty, Batanta, Waigiou, and Mysol." (Salvadori.)

I have discovered no notes respecting the wild life, but Dr. Guillemard ("Proceedings of the Zoological Society," 1885, p. 621) says: "Iris light yellow in the adult, yellowish-brown in immature birds. Bill bright orange-red; tarsus black." "This species was found to be extremely abundant in Waigiou."

With respect to its behaviour in captivity, Dr. Russ says that it has been "known and beloved from of old." "According to Dr. Meyer, it is abundantly kept in New Guinea, and learns to speak excellently. A female in Dr. Scheuba's possession was uncommonly companionable and confiding, gave kisses, allowed itself to be cuddled and played with like a kitten, often whistling with pleasure; but occasionally, even at night, it piped sharply and shrilly; spoke tolerably often, preferably in the evening, in a deep tone, also made attempts at imitating songs."

Other writers have spoken favourably of the ability of this Parrot, Dr. Finsch alone being inclined to scepticism on this point.

The closely related Red-breasted Lory (*L. erythrothorax*) was secured (one specimen only) by Mr. C. B. Horsbrugh in New Guinea, and reached the London Zoological Gardens in 1908. It may be the first and last specimen imported for all we know, and is hardly likely ever to be freely offered in the bird market.

Purple-capped Lory (*Lorius domicella*).

Bright red, the mantle and back a little deeper than the other parts; the forehead and crown deep violet, inclining to black; the wings green, the coverts above and the inner quills olivaceous; base of inner web of quills yellow; the bend of the wing and under-coverts blue tipped with whitish; tail purplish-red at tip above, but orange-red below; a yellow band across the fore-chest; shanks clear blue, feet blackish-grey with the claws black; beak orange-red; iris brown, brownish yellow, or orange, with a narrower ring round the pupil, clear yellow; naked skin round eyes blackish. Female probably with its beak narrower at the base than in the male. Hab., Ceram and Amboyna.

In the young there is a greenish tinge between the shoulders, and the shank-feathers are mostly dull green.

Dr. Guillemard mentions an example of this species which became partly yellow in confinement; this he notes as a well-known tendency in many of the Parrot tribe.

It is said to be imported from its native islands by way of Java, and has been known in the trade as long as any species of its group, but is still far from cheap.

Russ says that as a rule this Lory only learns single words, and at best prattles short observations quickly and hurriedly; its call is not so shrill, more flute-like than that of other Lories. In several instances he has known it to live many years in a cage; it becomes tame fairly quickly.

Dr. C. S. Simpson gave an account of a specimen of this species in his possession in the first volume of *The Avicultural Magazine*, pp. 69, 70.

Green-tailed Lory (*Lorius chlorocercus*).

Red; wings green, bend of wing bluish-white; base of inner web of primaries red; tail above red at base, distal half green; a broad yellow band across lower throat; a black patch on each side of neck; tibiæ and under wing-coverts blue; tail below red at base, golden olive towards distal extremity; beak orange-red; feet black; irides bright red to pale orange, with a narrow white ring round the pupil. Female with the beak narrower both at base and tip than in the male. Hab., Solomon Islands.

Consul Layard received a pair of this species which had been taken from the nest in a hole in a tree; one, doubtless the male, was lively and active, and uttered various notes, amongst which one could recognise the words "Pretty Joey," a name by which its captor had known it; it also whistled long and shrilly, and uttered several other sounds. The female was quieter. They were fond of drinking sugar-water in quantities, ate bread-sop, cooked potatoes, rice, various roots, and Indian figs; they fed peaceably out of a vessel or upon the aforesaid fruit. The male was charmingly tame, and allowed itself to be handled.

A pair of this species was purchased by the Zoological Society of London and exhibited in the Gardens at Regent's Park in 1867.

Blue-thighed Lory (*Lorius tibialis*).

Red; wings green; bend of wing blue, with whitish tips to the feathers; some of the upper wing-coverts and primaries washed with dull red, base of inner webs of primaries yellow; tail red, with a dark purple band at tip; an ill-defined yellow band across the lower throat; under wing-coverts blue tipped with whitish; tibiæ blue; beak orange; feet pale. Sexes not differentiated. Hab., unknown. The type is in the British Museum.

The typical specimen was purchased by the Zoological Society of London in May, 1871, and was described and named by Dr. Sclater. It is not mentioned by Dr. Russ in his "Handbook."

Chattering Lory (*Lorius garrulus*).

Red; interscapular region sometimes minutely spotted with yellow; wings green, the bend of wing yellow; upper wing-coverts tinged with olive; base of inner webs of primaries red; tail with basal half red, distal half dark purple tinged with green; tibiæ dark green; under wing-coverts yellow; distal half of tail below golden-red; beak red; feet dusky; irides deep yellow, with a brighter yellow inner ring. Female not differentiated, but probably with the base of the beak narrower. Hab., Halmahera.

Schlechtendal considered this bird to be an arrant screamer and not very clever; one in Mr. Blaauw's possession, on the other hand, showed remarkable talent, mimicked all kinds of sounds which it heard, learned to speak a good deal in a soft voice, and almost with understanding. It was always very excitable and passionate, snapping its beak at everyone who approached it. Its note was not so metallically sharp as in the other Lories, only annoying because of the endless repetition of the same note. It was quiet, however, if taken out of the cage. Mr. Heer (a lawyer) held similar views of it. One in the possession of Mr. Scheuba laid eggs on several occasions. According to Russ, in his "Handbook," the price in the German market varies from 30s. to £5. The first two examples (a pair) owned by the London Zoological Society were purchased in January, 1864, since which time a good many examples have been exhibited in the Gardens, the last recorded in the ninth edition of the Society's list having been presented in 1890.

Yellow-backed Lory (*Lorius flavo-palliatus*).

Differs from the preceding species in having a broad yellow patch on the interscapular region. Female with the beak narrower at base and the culmen less arched. Hab., "Obi, Batchian, Morotai, Raou."—(Salvadori.)

Dr. Guillemard ("Proceedings of the Zoological Society," 1885, p. 564) says: "Iris of the Batchian birds yellow or orange; of the Obi birds yellowish-brown. Bill orange; feet greyish-black. With the exception of the different colour of the iris, there is no noticeable difference between the birds from the Obi group and from Batchian."

Although this species has been exhibited at the London Zoological Gardens more than once, it does not appear in Russ' Handbook; whether he includes it in his later work I cannot say, as I do not possess the volume dealing with the Parrots.

Under the genus *Vini*, Russ describes *V. australis*, but he does not say whether it has ever been imported; possibly, as in other cases, he thinks it may be some day.

Kuhl's Lory (*Vini kuhli*).

Above green; the upper back or interscapular region olivaceous, but the lower back, rump, and upper tail-coverts yellowish; wings with the outer webs of the primaries edged with blue, the inner webs black; tail

1. Black-faced Lovebirds. 2. Black-winged Lory.

purplish-red on the inner webs with a blackish spot, the outer webs blackish-violet, tips of feathers yellowish-green; forehead and front of head dark grass-green; back of head dark violaceous-blue; lores, cheeks, throat, and breast, red; middle of abdomen purple; flanks and under tail-coverts yellowish-green; greater under wing-coverts black, smaller ones green; beak and feet red; irides red with an inner ring of yellow. Female not differentiated. Hab., Washington and Fanning Islands.

Once imported, in 1879, by Miss Hagenbeck.

It is disheartening, after looking through the pages of many volumes, to discover how very little has been published about the wild life of the true Lories. Of course, we know that they nest in holes in trees and lay white eggs, and we are well aware of the nature of their food; nevertheless, until the life history of each separate species has been described we never know what unexpected details may turn up; it is also interesting to know whether a bird nests at a great height or near to the ground, the number of its eggs, how long they take to incubate, whether both parents sit and feed the young, how long the young take to develop, and whether or no their nestling plumage differs from that of their parents.

LORIKEETS.

We now come to the Lorikeets, which my friend Mr. Seth-Smith has included (unlike the Lories) in his work on the Parrakeets. Respecting the sexes of the Lorikeets, he says (as I have noted in my book, "How to Sex Cage-Birds," p. 107):—"The sexes are, so far as I am aware, alike in plumage in all the Lories, but, in most cases at least, the females are slightly less in size than the males, and possess a smaller and more effeminate-looking head."

Blue-faced Lorikeet (*Trichoglossus hæmatodes*).

Back, wings, and tail green, feathers of interscapular region with concealed yellow spots, sometimes tinged with red; forehead, cheeks, and chin blue; back of head, ear-coverts, and throat green; a greenish-yellow band on the nape; breast yellow, more or less suffused with orange, the feathers with diffused green edges; flanks and under wing-coverts yellow, more or less tinged with red; middle of abdomen dark green; back of abdomen, thighs, and under tail-coverts greenish-yellow spotted with green; flights below dusky, with a yellow band; tail below yellow; beak red; feet dark grey; irides yellow or red. Female probably with narrower beak and the orange suffusion on the breast less pronounced. Hab., Timor.

I have found no notes on the wild life. It is a rarely imported bird which first arrived at our Regent's Park Gardens in 1863; a second specimen being purchased in 1874.

Forsten's Lorikeet (*Trichoglossus forsteni*).

Back, wings, and tail green, feathers of interscapular region with concealed red spots and brownish-purple edges; head purplish brown more or less suffused with blue, vertex faintly tinged with green; a greenish-yellow band on the nape; throat and abdomen dark purple; breast bright scarlet; flanks, vent, and under tail-coverts yellow, all the feathers broadly tipped with green; under wing-coverts red; flights below dusky black, with a yellow band; tail below yellow-greyish on inner feathers; beak red, pale yellow at tip of upper mandible; feet olive-green; irides probably red. Female with narrower and more tapering beak. Hab., Sumbawa.

Mr. Frank Finn says (*The Ibis*, 1901, p. 439) that, since 1894, this has been quite the most commonly imported species of Lory in the Calcutta market. Two examples of *T. forsteni* were added to the Zoological Society's collection at Regent's Park in December, 1896. In 1900 Mrs. Michell purchased a pair from Jamrach which went to nest in the hollow part of an old tree in her outdoor aviary; laying in all three eggs; the first two eggs were removed, but the third was hatched and reared. An account is published in *The Avicultural Magazine*, Second Series, Vol. IV., pp. 24, 25.

Green-naped Lorikeet (*Trichoglossus cyanogrammus*).

Back, wings, and tail green; a yellowish-green band on the nape, the feathers of which are crossed in the middle by a concealed red band, as also are the interscapular feathers; forehead and cheeks blue; vertex greenish; back of head, ear-coverts, and throat purplish-black; lower throat and upper breast scarlet with purplish-black edges to the feathers, excepting at sides of breast where the edges are green; middle of abdomen green, lower abdomen and flanks yellow, barred with green; under tail-coverts yellow, tipped with green; under wing-coverts red; flights below dusky, broadly banded with yellow at the base, the latter tinged with red on the inner secondaries; tail below olive, with the inner webs of the feathers yellow; beak orange-red; feet lead-colour; irides red. Female probably with the beak narrower at the base than in the male. Hab., Amboyna group and Western Papua.

According to Salvadori this species "frequents the smaller branches of coppices and the tops of low trees, and nourishes itself on *casuarina* seeds, fruit and nectar. It is a quarrelsome and noisy bird" (*cf.* Seth-Smith, "Parrakeets," p. 6).

This Lorikeet was exhibited in the London Zoological Gardens in 1874; it has also reached the Hamburg Gardens, and in 1879 Dr. Platen brought home three examples.

Black-throated Lorikeet (*Trichoglossus nigrigularis*).

Differs from the preceding in the more uniform colouring of the head—blue, with the vertex and back of head green, the latter showing hardly a trace of purplish; throat purple; breast paler and of a more orange-red colour, with narrower dark borders to the feathers; middle of abdomen more or less varied with black. Hab., Aru, Southern New Guinea along the middle of the Fly River, and Ke Islands.

Dr. Guillemard says ("Proceedings of the Zoological Society," 1885, p. 623):—"Iris orange; bill bright orange-red; feet greyish black." "A common bird at Dobbo especially, differs from *T. cyanogrammus* in the greater length of tail and wings."

Mr. W. A. Harding obtained a pair of this species through Mrs. Johnstone, who imported them in 1904. In *The Avicultural Magazine*, Second Series, Vol. IV., pp. 21, 22, he has published an illustrated account of the species, in which he quotes the following notes by Wallace (*Annals and Magazine of Natural History*, New Series, Vol. XX., p. 475):—"The very first bird to attract one's attention at Dobbo (Aru Islands) is a most beautiful brush-tongued Parroquet, closely allied to *Trichoglossus cyanogrammus*, Wagl. It frequents in flocks the casuarina-trees which line the beach, and its crimson under wings and orange breast make it a most conspicuous and brilliant object. Its twittering whistle

may be heard almost constantly in the vicinity of the trees it frequents."

Mitchell's Lorikeet (*Trichoglossus mitchelli*).

Back, wings, and tail green; a yellow-green band across the nape; interscapular region with concealed red spots on the feathers; head purplish-brown, front and lores slightly bluish; vertex and cheeks slightly tinged with green; a green band on the throat; breast bright red, tinged with orange towards the tips of the feathers, which are more or less faintly edged with green; abdomen green, tinged with deep brownish-purple; vent and under tail-coverts green, yellow at base of feathers; thighs yellow; under wing-coverts red; flights below dusky black, with a yellow band; tail-feathers below with their inner webs edged with yellow; beak red; feet dark grey; irides red. Hab., unknown.

Formerly only known from two females living in the London Zoological Gardens and one in the Amsterdam Gardens. I must, however, have seen a male, as I note that its "beak is broader beyond the middle, and tapers less than that of the female" ("How to Sex Cage-Birds," p. 108).

Swainson's Lorikeet (*Trichoglossus novæ-hollandiæ*).

Back, wings, and tail green; a yellowish-green band on the nape; crown of the head, face, cheeks, and throat purplish blue, the breast and under wing-coverts, vermilion red; the belly, bright blue; a yellow band on under surface of wing; under tail-coverts yellow at base, green at tip; inner webs of lateral tail feathers yellow; beak orange-vermillion tipped with yellow; feet leaden grey; irides reddish-brown. Female with shorter beak, narrower towards the tip; she is also, as usual, perhaps a trifle smaller than the male. Hab., Eastern Australia, from Cape York to Victoria and Tasmania. As usual, this Lory, in its own country, breeds in holes in the branches of trees, in which it deposits four white eggs. Being essentially an arboreal species, it rarely visits the solid ground; its legs, indeed, are suited rather for climbing than running. Gould says of this species: "The flowers of the various species of eucalypti furnish this bird with an abundant supply of food, and so exclusively is it confined to the forests composed of these trees that I do not recollect to have met with it in any other. However graphically it might be described, I scarcely believe it possible to convey an idea of the appearance of a forest of flowering gums tenanted by *Trichoglossi*; three or four species being frequently seen on the same tree, and often simultaneously attacking the pendent blossoms of the same branch. The incessant din produced by their thousand voices, and the screaming notes they emit when a flock of either species simultaneously leaves the trees for some other part of the forest, is not easily described, and must be seen and heard to be fully comprehended. So intent are they for some time after sunrise upon extracting their honey-food that they are not easily alarmed or made to quit the trees upon which they are feeding."

I suppose many of us have seen the effect of waves of sound upon sand distributed evenly over a thin steel plate, but to see sound itself surpasses all human experience.

The Northern form of this species is described as a distinct sub-species by Robinson, and in *The Ibis* for 1900 he says it can readily be distinguished by its smaller size and by the brighter and purer blue of the head and abdominal patch; he thus describes the soft parts:—"Iris red; feet black; bill red," quoting Olive as the authority.

The principal food in a wild state consists of the nectar and pollen of eucalyptus flowers, as well as the seeds of grasses and insects. When kept in captivity Dr. Russ recommends "canaryseed, millet, hemp, oats, egg-bread, boiled rice, fresh or soaked ants' eggs, sweet ripe fruit, cherries, berries, grapes, dates, figs, etc." In place of the egg-bread and ants' eggs I should substitute stewed apple mashed up with sponge-cake; also plenty of wholesome green-food in season, together with any flowers of fruit trees, including may-blossoms. This Lorikeet has been bred on several occasions in Germany and at least once in England, but it is not altogether a desirable bird to keep. Unless an aviary can be devoted to it alone, a separate cage will be more suitable, as it is considered by most aviarists who have kept it to be of a combative disposition; at the same time, as a cage-bird, it becomes very annoying on account of its shrieking propensities. The popular dealer's name for the species is "Blue Mountain Lory."

Red-collared Lorikeet (*Trichoglossus rubritorques*).

Back, wings and tail green; an orange-red band on the nape and a blue band on the hind neck; interscapular feathers, orange-red at the base; head and throat blue; breast orange-red; middle of abdomen dark green; flank-feathers yellow edged with green; under tail-coverts greenish-yellow tipped with green; lateral tail feathers with yellow inner webs; under wing-coverts vermilion; flights yellow at base of inner webs; beak red; feet ashy grey; irides red with a narrow yellowish ring round the pupil. Female, with the beak narrower beyond the middle and more tapered towards the tip. Hab., N.W. Australia.

A near relative of the preceding species, which it resembles in its habits. According to Gilbert (in Gould's "Handbook," Vol. II., p. 96), "It is generally seen in large flocks, feeding on the summits of the loftiest trees. Its flight is rapid in the extreme. Like the other *Trichoglossi*, its food consists of honey and the buds of flowers."

Mr. D. Le Souëf (*The Ibis*, 1899, pp. 360, 361) says:—"These birds are very plentiful in the north-western coastal districts and are very noisy, flying generally in flocks, screeching as they go, and feeding on the honey of the various flowering trees and shrubs. They nest in the hollow spouts of the eucalyptus-trees at various distances from the entrance.

"The eggs are elongate and slightly smaller at one end, and are of a dull white colour, but soon get stained brown. December and January seem to be their principal nesting-season, and the two clutches herein described were found respectively on December 29th, 1898, and January 25th, 1899, and they measure:—(1) A. 1.4 by 0.82 inch; B. 1.8 by 0.84; (2) A. 1.6 by 0.82 inch; B. 1.2 by 0.83.

"These eggs were exhibited before the Field Naturalists' Club of Victoria on March 13th, 1899."

This Lorikeet has been represented in the London Zoological Society's collection at Regent's Park.

Ornamental Lorikeet (*Trichoglossus ornatus*).

The prevailing colour is green in several shades; the crown is purplish-blue, bounded at the back by a band of blue-tipped scarlet feathers; the ear-coverts are purplish-blue; a broad oblique bright yellow band runs down the side of the neck; the cheeks and chin are scarlet, the throat and breast also scarlet, but the feathers tipped with blue-black; the flanks are yellow barred with green, and the vent is yellowish; the primaries are bluish on the outer web; the beak is orange-red; the feet pale greyish-blue; the naked skin round the eye pale blue (bluish-black according to Russ); the iris chestnut. Female with shorter beak, narrower to-

wards the tip. Hab., Celebes, Buton, and the Togian Islands.

Like most *Trichoglossi*, this is an abundant and a noisy bird in its native islands, and is caught in considerable numbers and kept by the natives, who feed it upon rice and bananas.

It was rare in the trade until 1895, when a great importation took place, and specimens were offered to everyone who was considered likely to purchase them, to me amongst others. Though very gaudy in colour, the bird offended my artistic taste by its higgledy-piggledy combination of brilliant colours, which forcibly reminded me of the patchwork mats sometimes to be seen at seaside lodging-houses. The hens of this species cannot have any eye for colour-harmonies to have selected such obtrusive colouring for their lords, and it serves them right to have had to adopt the same dress themselves. No, I could not have a thing like that always before my eyes, so I was not tempted to purchase any.

A capital account of the species (accompanied by an excellent coloured plate by Frohawk) is given by Dr. C. S. Simpson in *The Avicultural Magazine*, Vol. III., pp. 81-84. The author is of opinion that this Lorikeet should be kept only in an aviary, as he found its movements too abrupt for the limited area of a cage.

Dr. Russ states that this species frequently dies suddenly, although apparently healthy and in perfect plumage.

Mrs. Johnstone's Lorikeet (*Trichoglossus johnstoniæ*).

General colour grass-green; the first primary black; all the primaries excepting the first three with a large yellow patch on the middle of the inner webs; tail-feathers with black inner webs; forehead deep rosy-red, with greenish tips to the feathers in the male; lores, orbital ring, and a stripe from the eyes backward to the nape (ill-defined in the female) deep brownish-purple; feathers round mandible and above and below ear-coverts dark rose-red, those nearest to ear-coverts tipped with yellowish-green; feathers of breast and greater part of abdomen yellow with grey bases and broad green tips; lower abdomen and under tail-coverts much greener; under wing-coverts yellowish-green, greener towards edge of wing, some of the longest pale yellow; tail below greenish or brownish yellow; beak salmon-red, paler at tomium; feet ashy-grey; irides red; eyelids apparently blue.* Hab., Philippines.

This Lorikeet was obtained on the mountains of Mindanao, and brought home for Mrs. Johnstone by Mr. Walter Goodfellow, who, in *The Avicultural Magazine*, Second Series, Vol. IV., pp. 83-87, has given an account of its discovery. Like all the Lories, when shot much clear honey runs from the beak, and unless great care is taken to stop up beak and nostrils with cottonwool this makes a great mess of the feathers.

Mr. Goodfellow says: "The native Bagobo name for them is 'Lish-lish,' after their call-note. This custom of naming birds by their call is generally adopted by wild tribes all the world over, and almost entirely so by the Bagobos. Every evening from my camp on Apo I used to hear them passing overhead in small flocks to their sleeping-places lower down the mountain, returning again to the higher forests with the break of day; but at these times it was seldom possible to catch even a passing glimpse of them on account of the camp being much shut in by trees. When flying they utter incessantly their pretty 'lish-lish.'"

In the succeeding volume of *The Avicultural Magazine* Mrs. Johnstone published a very interesting account of the successful breeding of this species in one of her aviaries. They nested in a small wooden box, with a cocoanut husk cemented at the bottom; in both cocoanut husk and box rough nests were constructed of ends and twigs of fir mixed with cocoanut fibre; this is the only known instance of any Lory or Lorikeet making a nest. Incubation apparently lasted three weeks, and four weeks later the two young left the nest perfectly fledged, but with black beaks, a fine white ring of skin round the eye, the flights edged with white, and the maroon stripe from eye to eye less defined on the nape. Both parents seem to have incubated and attended to the young; these were fed on spray millet, sweetened bread and milk, and half an orange daily, the food being, of course, regurgitated by the parents.

These Lorikeets, though perhaps less beautiful than some of the better-known kinds, have one great advantage over the latter. Coming from a high altitude they are perfectly hardy, and Mrs. Johnstone says that throughout the winter they were out on every passable day scrambling and playing.

Scaly-breasted Lorikeet (*Psitteuteles chlorolepidotus*).

Crown bluish-green; remainder of upper surface grass-green, deeper in front than behind; the mantle mottled with yellow, flights with their inner webs greyish-black, with a broad orange-red transverse spot, below ash-grey with red transverse bar; under wing-coverts and axillaries red; tail ochre-yellow below, with the basal half of the inner webs reddish; chin and throat clear green; breast yellow, the feathers with green outer crescents; abdomen green mottled, with yellow at the sides, the bases of some of the feathers inclining to reddish; under tail-feathers yellowish-green; beak red, the cere fleshy-grey; feet greyish-brown with black claws; iris varying from dark brown (Russ) to scarlet, or scarlet with buff inner circle to yellow. Female not differentiated. Hab., Australia, from Rockingham Bay through the interior to South Australia.

According to Mr. North, the Scaly-breasted Lorikeet breeds in the hollow spouts of eucalypti near the Dawson River, and of seven nests obtained each contained but a single egg, in several instances in an advanced state of incubation. As usual, the eggs are white, smooth, slightly tapering at one end.

It associates with other Lorikeets, feeding on honey from the cups of expanded blossoms of eucalypti.

According to Campbell, this species sometimes lays two eggs. In captivity it is reported as long-lived, amiable, and sociable, and its cry is said to be less penetrating than that of other species. According to Mr. Seth-Smith ("Parrakeets," p. 15), "this species seems to take more kindly to a diet of canaryseed than do most of the Lorikeets, and probably examples fed entirely upon seed would not long remain free from fits, or would very soon lose the natural brightness of their plumage."

An instance of the species breeding in captivity was recorded in "Notes on Cage-birds," p. 170 (1899); two young were reared.

Usually imported in small numbers, but in 1883 Mr. Abrahams received a considerable number. It is said to have been bred in an open-air aviary in London in the winter of 1883-84, when the water was frozen every night and sometimes in the daytime. There ought, therefore, to be no difficulty in keeping this species.

* The soft parts are described from Gronvold's illustration from the living bird.

SCALY-BREASTED LORRIKEETS.

PERFECT LORIKEET (*Psitteuteles euteles*).

Above green; tail-feathers yellowish-green on inner webs; head yellowish-olive; under-surface yellowish-green; flights below blackish, yellow towards base of inner webs; beak yellow; feet dark. Female not differentiated. Hab., "Timor, Flores, Wetter, Lettie, Babbar, and Timor-Laut." (Salvadori.)

I have not come across any information respecting the wild life of this almost uniformly-coloured little Lorikeet, but it probably has much the same habits as its allies.

A pair were deposited in the London Zoological Gardens in 1896, and Mr. Seth-Smith reports them as still living (in a cage) in May, 1902, in the most perfect health and condition.

RED-CROWNED OR VARIED LORIKEET (*Ptilosclera versicolor*).

Green, streaked with yellowish-green; crown and lores red; ear-coverts and a band at back of head yellowish; cheeks and a collar on the nape bluish; breast vinous red, brighter at the sides; flights below blackish, with yellowish inner webs; tail below yellowish; beak red; cere and naked orbital area greenish-white; feet pale ashy-grey; irides brown. Female not differentiated. Hab., Northern and Western Australia. Gould says of this species ("Handbook," Vol. II., pp. 98, 99): "It is particularly abundant at Port Essington, where its suctorial mode of feeding leads it, like the other members of the genus, to frequent the flowery *Eucalypti*. Gilbert informed me that it 'congregates in immense numbers; and when a flock is on the wing their movements are so regular and simultaneous it might easily be mistaken for a cloud passing rapidly along, were it not for the utterance of the usual piercing scream, which is frequently so loud as to be almost deafening. They feed on the topmost branches of the *Eucalypti* and *Melaleucæ*.'"

Campbell ("Nests and Eggs," p. 595) says: "These Lorikeets are said to breed in the hollow limbs of trees on the margin of the Margaret River, North-west Australia." The above seems to be all that is known respecting the wild life, excepting that Mr. Fred L. Berney records the fact that he saw two broods, three and four respectively, that were taken from their nests, hollow spouts in trees, about September 15.

About the middle of November, 1902, about nine pairs of this pretty Lorikeet came into Mr. Hamlyn's hands, and were rapidly distributed over the country; one supposed pair went to the Zoological Gardens, another to Mr. R. Phillipps, a third to Mr. Seth-Smith, a fourth apparently to Mr. E. J. Brook (unless he obtained his from Mr. Seth-Smith), a fifth to Mr. Hawkins, and a single specimen seems to have been purchased for exhibition by Miss Rosa Little, since only one specimen is recorded as having been shown by her. I saw Mr. Seth-Smith's specimens on several occasions. The pair at the Gardens went to nest in 1906, but whether with satisfactory results I do not know. An account of the species, with a coloured plate, was published by Mr. Phillipps in *The Avicultural Magazine*, Second Series, Vol. I., pp. 287-291.

MUSKY LORIKEET (*Glossopsittacus concinnus*).

The prevailing colour, as usual, is grass-green; the forehead, lores, and ear-coverts red; back of head bluish; nape and upper back brownish-olive; back and sides of neck mottled with yellow; inner webs of flights sooty, below blackish-grey; inner webs of lateral tail-feathers yellowish, red at base; beak blackish-brown; feet ashy-grey; iris "brownish-yellow to yellowish-red" (Russ); "buff, surrounded by a narrow circle of yellow" (Gould); naked skin encircling eye described as brownish. Female not differentiated. Hab., Australia, from Queensland to South Australia and Tasmania.

Gould says: ("Handbook to the Birds of Australia," Vol. II., pp. 100, 101): "Like every other species of Lorikeet, the present bird is always to be found upon the *Eucalypti*, whose blossoms afford it a never-failing supply of honey, one or other of the numerous species of that tribe of trees being in flower at all seasons of the year. It is stationary in New South Wales, but I am not certain that it is so in the more southern country of Tasmania, where it is known by the name of the Musk-Parrakeet from the peculiar odour it emits.

"It is a noisy species, and with its screeching note keeps up a perpetual din around the trees in which it is located. During its search for honey it creeps among the leaves and smaller branches in the most extraordinary manner, hanging and clinging about them in every possible variety of position. It is so excessively tame that it is very difficult to drive it from the trees or even from any particular branch. Although usually associated in flocks, it appears to be mated in pairs, which at all times keep together during flight, and settle side by side when the heat of the sun prompts them to shelter themselves under the shade of the more redundantly-leaved branches.

"The eggs, which are dirty white and two in number, are of a rounded form, 1in. in length and $\frac{7}{8}$in. in breadth. Those I obtained were taken from a hole in a large *Eucalyptus* growing on the Liverpool range."

In captivity this species is said, by those who have kept it, to be very subject to fits, not only in England, but also in its native land. Though formerly rare in the market, of late years it has been imported in some numbers. It first reached the London Zoological Gardens in 1869.

CHAPTER IX.

COCKATOOS AND COCKATIEL

(*Cacatuidæ*).

A very natural group of birds which, with one exception, are peculiar to the Australian region; they are not found further to the east than the Solomon Islands. They are characterised by an ossified orbital ring, a very deep beak, with the upper mandible usually much compressed, and the terminal hook generally almost vertical (*Licmetis* is an exception) and with its under surface roughened like a file; the head is always more or less crested.

In captivity I have found the most suitable food for Cockatoos to consist of maize, oats, wheat, dari, hemp or sunflower, nuts in winter, peas in the pod in summer, apple, raw carrot, lettuce, or other wholesome uncooked green food, and plain dry biscuit. A little boiled maize does not hurt occasionally, but should not (I think) be given as a regular article of diet. Woodboring grubs might be given to Black Cockatoos. Some of these birds talk fairly well, but all, when first imported, are liable to scream abominably; when acclimatised, however, many of them lose this objectionable habit and make very amiable pets.

Cockatiels do best upon a diet of canary, with a little hemp and a few oats; also chickweed, groundsel and

dandelion; when breeding they require some soft food (sopped bread pressed nearly dry will do), with which to feed their young. In an outdoor aviary they breed freely, but indoors they frequently fail. They are pretty, fairly innocent, but noisy birds, repeating the same phrase over and over until it becomes irritating.

GREAT BLACK COCKATOO (*Microglossus aterrimus*).

Slaty-black, when living powdered with grey; wings and tail with a green gloss; forehead and lores intense velvety black; a long crest of narrow feathers on the head; naked cheeks pale red, passing into pale yellow on the borders; beak and feet black; irides dark brown. Female smaller than male, with much shorter and less regularly tapered beak, with a considerably shorter terminal hook. Hab., Papuan Islands and North Australia.

Gould ("Handbook," Vol. II., p. 28) quotes the following note by Mr. Macgillivray:—"This very fine bird, which is not uncommon in the vicinity of Cape York, was usually found in the densest scrub among the tops of the tallest trees, but was occasionally seen in the open forest land perched on the largest of the *Eucalypti*, apparently resting on its passage from one belt of trees or patch of scrub to another. Like the *Calyptorhynchi*, it flies slowly, and usually but a short distance. In November, 1849, the period of our last visit to Cape York, it was always found in pairs, very shy, and difficult of approach. Its cry is merely a low, short whistle of a single note, which may be represented by the letters '*Hweet-hweet*.' The stomach of the first one killed contained a few small pieces of quartz and triturated fragments of palm cabbage, with which the crop of another specimen was completely filled; and the idea immediately suggests itself that the powerful bill of this bird is a most fitting instrument for stripping off the leaves near the summits of the *Seaforthia elegans* and other palms to enable it to arrive at the central tender shoot."

A. J. Campbell ("Nests and Eggs," p. 601) quotes the following field-note by Mr. Harry Barnard: "They have a singular habit of breaking off, with the aid of their powerful bill, green twigs about the thickness of a man's finger, stripping them of their leaves, and dropping the bare twigs into the nesting-hole. The birds then bite the twigs into pieces about 2in. or 3in. in length. One nest in particular, which Mr. Barnard examined in a large bloodwood (*Eucalyptus*) stump, had the bottom of the hole covered to a depth of about 4in. with the portions of sticks. With regard to the use of this bottom lining, Mr. Le Sonëf suggests a feasible explanation, that, as the birds breed from November to March—the rainy season—and as the nesting-holes are usually in upright trunks which would catch much rain, the 'dunnage' of sticks would keep the egg or young off the damp rotten *débris* at the bottom of the hole."

Mr. Campbell (p. 600) thus describes the nest and eggs:—

"*Nest.*—The hollow branch or bole of a tree.

"*Eggs.*—Clutch, one usually; round-oval in shape; texture somewhat coarse or granulated; surface has a slight trace of gloss, also a few limy nodules; colour white. Dimensions in inches of single examples: (1) 2.16 by 1.58, (2) 2.05 by 1.5."

This bird first reached the London Zoological Gardens in 1861, since which time others have been added to the Society's collection. Russ speaks of it as of late occurring occasionally in the trade, and says that Dr. Platen brought home three examples. In 1907 Mr. Walter Goodfellow brought home a specimen from New Guinea, of which Mr. Seth-Smith says: "A most extraordinary bird, with an enormous bill, well adapted for breaking hard nuts, upon which it largely subsists in a wild state. The lower part of the face is bare of feathers and the skin bright red. The bird is wonderfully tame and gentle, and delights in being petted." (*The Avicultural Magazine*, Second Series, Vol. V., p. 243.)

FUNEREAL COCKATOO (*Calyptorhynchus funereus*).

Brownish-black glossed with green, especially on the head; body-feathers with narrow brown margins, more

COCKATOO BELONGING TO H.M. QUEEN ALEXANDRA.
(Photograph from life.)

or less olivaceous on the under-surface; tail-feathers, excepting the two central ones, crossed by a broad brimstone-yellow belt, more or less variegated with irregular zigzag brownish-black markings; external web of outer feathers and margin of external webs of all the others brownish-black; ear-coverts dull waxy-yellow; beak black; feet mealy blackish-brown; irides blackish-brown. Female not differentiated, but probably differs much as in the preceding species. Hab., South-Eastern Australia and Tasmania.

Gould says of this species ("Handbook," Vol. II., p. 21): "The thick brushes clothing the mountain sides and bordering the coast-line, the trees on the plains, and the more open country are equally frequented by it; at the same time it is nowhere very numerous, but is usually met with associated in small companies of from four to eight in number, except during the breeding

season, when it is only to be seen in pairs. Its food is much varied; sometimes the great belts of Banksias are visited and the seed-covers torn open for the sake of their contents; while at others it searches with avidity for the larvæ of the large caterpillars which are deposited in the wattles and gums. Its flight, as might be expected, is very heavy, flapping, and laboured, but it sometimes dives about between the trees in a most rapid and extraordinary manner.

"When busily engaged in scooping off the bark in search of its insect food, it may be approached very closely; and if one be shot the remainder of the company will fly round for a short distance and perch on the neighbouring trees, until the whole are brought down, if you are desirous of so doing.

"Its note is very singular—a kind of whining call, which it is impossible to describe, but which somewhat resembles the syllables *Wy-la*, whence the native name.

"The eggs, which are white and two in number, about 1⅞in. long by 1⅝in. broad, are deposited on the rotten wood in the hollow branch of a large gum."

Mr. Campbell ("Nests and Eggs," p. 604) quotes the following note by Mr. A. E. Brent: "For about three weeks, when the female is sitting, I discovered that the male would go to the nest three times a day—at morn, noon, and night—and was most regular. I would find myself standing, watch in hand, looking for him regularly every day for several days, and found that his times never varied more than seven minutes. To ascertain his reasons I went to the nest at night, and crept, without disturbing the sitting bird, to a spot from where I could see all that went on, and waited. After some time the old bird's cry would be heard in the distance, and at the same time the female's head would appear at the hole, and she would answer him with a small scream, and would repeat in answer to him as he drew near. As soon as he appeared in sight she would fly out and settle on a dry branch, meeting him there, and after the usual greeting he would sit and feed her for fully ten minutes, just as if she had been a young bird. After this she would sit and preen her feathers for a time, and then return to the nest, always entering the hole tail first. This performance I witnessed for several days."

First acquired for the Regent's Park collection in 1879, and subsequently in 1883; in 1880 Miss Hagenbeck exhibited a specimen at the "Ornis" Exhibition, in Berlin.

Banks' Cockatoo (*Calyptorhynchus banksii*).

Glossy greenish-black; tail, excepting the two central feathers, crossed by a broad crimson belt; external feather with the outer web, and all the other belted feathers with the outer margin, black; crest long; beak leaden grey to greyish-black; feet mealy black-brown; irides pale to black-brown. Female with the head and upper wing-coverts spotted and the under surface irregularly barred with yellow, which becomes redder on under tail-coverts; the red belt on the tail varied with irregular black bars, changing to sulphur-yellow on the inner margins of the feathers and into yellowish-red on under surface. Hab., "Eastern Australia, from Port Denison to New South Wales and Victoria." (Salvadori.)

Gould says of this species ("Handbook," Vol. II., p. 14): "It is not infrequently seen in the immediate neighbourhood of Sydney and other large towns, and it alike frequents the brushes and the more open wooded parts of the colony, where it feeds on the seeds of the *Banksiæ* and *Casuarinæ*, but occasionally changes its diet to caterpillars, particularly those that infest the wattles and other low trees. The facility with which it procures these large grubs is no less remarkable than the structure of the bird's bill, which is admirably adapted for scooping out the wood of both the larger and smaller branches, and by this means obtaining possession of the hidden treasure within.

"The Banksian Cockatoo is a suspicious and shy bird, and a considerable degree of caution is required to approach it within gunshot; there are times, however, particularly when it is feeding, when this may be more readily accomplished. It never assembles in large flocks like the White Cockatoo, but moves about either in pairs or in small companies of from four to eight in number. Its flight is heavy, and the wings are moved with a flapping, laboured motion; it seldom mounts high in the air, for although its flight is somewhat protracted, and journeys of several miles are performed, it rarely rises higher than is sufficient to surmount the tops of the lofty *Eucalypti*, a tribe of trees it often frequents, and in the larger kinds of which it almost invariably breeds, depositing its two or three white eggs in some inaccessible hole, spout, or dead limb, the only nest being the rotten wood at the bottom, or the chips made by the bird in forming an excavation."

The London Zoological Society first purchased this Cockatoo in 1862, since which time several other examples have been exhibited at the Gardens. Russ speaks of it as "very rare," and yet I think it has been more often owned and exhibited by private aviculturists in England than any of the other black species. Mr. C. A. Edwards's bird is a well-known prize-winner, and in 1907 a pair were exhibited by Sir C. Lawes Wittewronge, Bart.

Great-billed Black Cockatoo (*Calyptorhynchus macrorhynchus*).

Both sexes are very similar to the preceding species, but have a much heavier beak, shorter wings, and the female has yellow and scarlet mixed on the tail-belt. Hab., "Northern Australia, from Derby to Rockingham Bay." (Salvadori.)

Count Salvadori was rather doubtful as to the distinctness of this species from the Banksian Cockatoo.

Campbell says ("Nest and Eggs," p. 608): "Amongst the mountains and hills near our camp at Cardwell were some of these fine Cockatoos, at least, we took them to be the variety at present under consideration. They were exceedingly shy, and we only procured a pair."

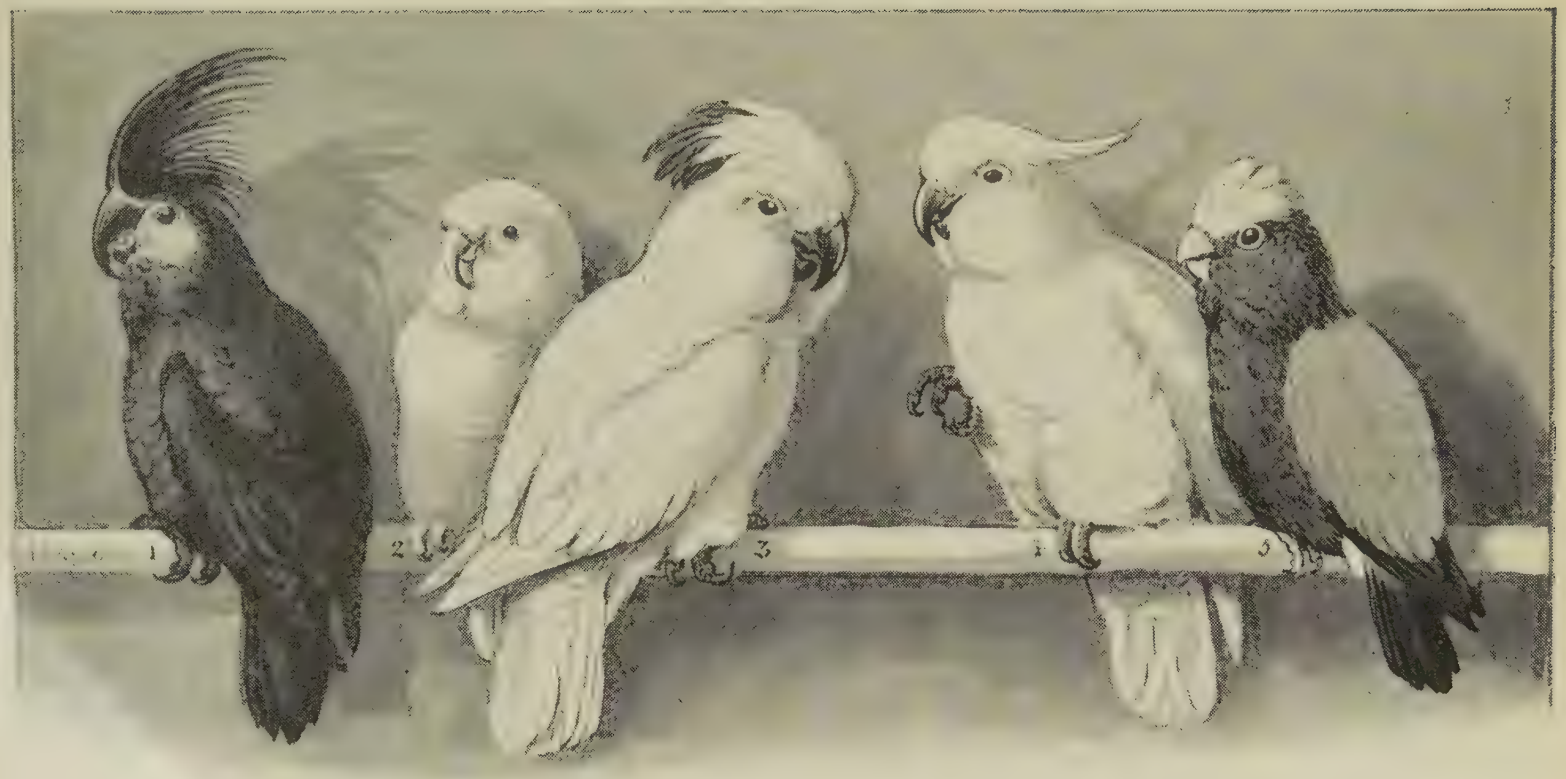
"When exploring in the far north, Mr. O'Donnell flushed a Black Cockatoo from its nest in a hollow tree. The bird was most probably this Great-billed species."

It is uncertain whether this species has been imported, but it is quite likely to have been confounded with Banks' Cockatoo. I include it on the strength of a note by Mr. Seth-Smith in *The Avicultural Magazine*, Second Series, Vol. II., p. 136.

Western Black Cockatoo (*Calyptorhynchus stellatus*).

Differs from the preceding in its smaller and more arched beak, shorter and more rounded crest and shorter tail. According to Gould "the male has the entire plumage glossy greenish-black; lateral tail-feathers, except the external web of the outer one, crossed by a broad band of fine scarlet; irides dark blackish-brown; bill bluish lead-colour, feet brownish-black, with a leaden tinge.

"The female has the upper surface similar to, but



A GROUP OF COCKATOOS.

1. Great Black. 2. Slender-billed. 3. Great Salmon-crested. 4. Lemon-crested. 5. Rose-breasted.

not so rich as, that of the male, and has an irregularly-shaped spot of yellowish-white near the tip of each of the feathers of the head, crest, cheeks, and wing-coverts; the under surface brownish-black, crossed by numerous narrow irregular bars of dull sulphur-yellow; the under tail-coverts crossed by several bars of mingled yellow and dull scarlet; the lateral tail-feathers dull scarlet, crossed by numerous irregular bars of black, which are narrow at the base of the feathers and gradually increase in breadth towards the tip." Hab., Western Australia.

Gould ("Handbook," Vol. II., p. 17) says: "As might be expected, its general economy closely resembles that of the other members of the genus. Except in the breeding season when it pairs, it may often be observed in companies of from six to fifteen in number.

"It breeds in the holes of trees, where it deposits its snow-white eggs on the soft dead wood. They are generally placed in trees so difficult of access that even the natives dislike to climb them. Those given to Gilbert by the son of the colonial chaplain were taken by a native from a hole in a very high white gum, in the last week in October; they are white, one inch and eight lines long by one inch and four lines broad.

"It flies slowly and heavily, and while on the wing utters a very harsh and grating cry, resembling the native name."

Jamrach imported an example of this species in 1885; it has been exhibited at the London Zoological Gardens, and may possibly also have got into private hands, but it is very rare in the market.

Ganga or Gang-Gang Cockatoo (*Callocephalon galeatum*).

Slate-grey; all the feathers excepting the flights and tail-feathers with greyish white edges, less distinct on under surface; secondaries and outer wing-coverts with a greenish tinge on outer webs; head, with the exception of the chin bright scarlet; beak pale horn-colour; feet mealy-black; irides blackish-brown. Female with pale grey bars on the flight and tail-feathers; the crest grey instead of scarlet; the feathers of the under surface edged with sulphur yellow and dull red; the under tail-coverts with dull yellow bars. Hab., South-Eastern Australia and Tasmania.

All that Gould could say of the habits of this species ("Handbook," Vol. II., p. 29) was:—"That it frequents the most lofty trees, and feeds on the seeds of the various *Eucalypti*."

A. J. Campbell ("Nests and Eggs," pp. 610, 611) says:—"To this day we are very much in the dark about the Gang-Gang, especially in reference to its nidification. Of course, like most Cockatoos, it lays in holes in tall forest trees. The only egg I have seen is a specimen which Mr. Keartland has kindly permitted me to redescribe from his collection, said to have been taken from the spout of a living eucalypt tree near Warragul, Victoria, October 20, 1897.

"The late Mr. Gregory informed me that he knew of an instance of five young Gang-Gangs having been taken from a nest in the Strathbogie Ranges.

"The Gang-Gang has the reputation of being easily tamed. It is not unlike an African Parrot, with forehead, crest and cheeks scarlet." Mr. Campbell thus describes the nest and eggs:—"*Nest.*—A hole or hollow in a tall tree in thick forest."

"*Eggs.*—Clutch, four to five; round oval in shape; texture of shell somewhat coarse; surface without gloss; colour, pure white. Dimensions in inches: 1.31 by 1.08; according to Le Souëf: (1) 1.28 by .92, (2) 1.25 by .94."

Dr. Greene says ("Parrots in Captivity," Vol. III., p. 131):—"Authors vary greatly in their estimate of the Helmeted Cockatoo; some declaring that it makes a most charming cage-bird and pet, while others, on the contrary, give it a character for peevishness, moroseness, and, in fact, everything that a pet should not possess."

I have only seen Mr. Seth-Smith's example, and (apart from its rarity) it struck me as being anything but an interesting bird. Russ, however, speaks well of the bird: a Mr. Westerman, of Amsterdam, had one which was a good talker.

The London Zoological Society first acquired a male of this species in 1859, and in 1864 a female was secured; since then other examples have been added to the Regent's Park collection. Whereas the late Dr. Greene regarded this Cockatoo as delicate and short-lived, Dr. Russ says of it:—"Vigorous and enduring, can be wintered without risk in an unheated room," and as Dr. Greene never possessed the species I should accept Dr. Russ' statement as more likely to be correct.

Greater Sulphur-crested Cockatoo (*Cacatua galerita*).

White with sulphur yellow crest, the feathers of the head and neck are pale yellow at the base, the ear-coverts are sometimes washed with the same colour, as are the bases of the inner webs of the flights and tail-feathers; the beak is black, the feet blackish, with black claws; the cere and naked skin round the eye white; the iris deep brown to reddish brown. Female smaller, the beak shorter and with shorter terminal hook. Hab., Australia and Tasmania.

Mr. Gould says of the present species ("Handbook," Vol. II., pp. 3, 4):—"As may be readily imagined, this bird is not regarded with favour by the agriculturist, upon whose fields of newly-sown grain and ripening maize it commits the greatest devastation; it is consequently hunted and shot down wherever it is found, a circumstance which tends much to lessen its numbers. It evinces a decided preference for the open plains and cleared lands, rather than for the dense brushes near the coast; and, except when feeding or reposing on the trees after a repast, the presence of a flock, which sometimes amounts to thousands, is certain to be indicated by their screaming notes, the discordance of which may be easily conceived by those who have heard the peculiarly loud, piercing, grating scream of the bird in captivity, always remembering the immense increase of the din occasioned by the large number of birds emitting their harsh notes at the same moment; still I considered this annoyance amply compensated by their sprightly actions and the life their snowy forms imparted to the dense and never-varying green of the Australian forest—a feeling participated in by Sir Thomas Mitchell, who says, 'Amidst the umbrageous foliage, forming dense masses of shade, the white Cockatoos sported like spirits of light.'

"The situations chosen for the purpose of nidification vary with the nature of the locality the bird inhabits; the eggs are usually deposited in the holes of trees, but they are also placed in fissures in the rocks wherever they may present a convenient site; the crevices of the white cliffs bordering the Murray, in South Australia, are annually resorted to for this purpose by thousands of this bird, and are said to be completely honeycombed by them. The eggs are two in number, of a pure white, rather pointed at the smaller end."

The Greater Sulphur-crest is fairly common in the bird-market, where (according to Russ) it commands a price varying from 15s. to £5; whether these are lower or higher than our English prices I cannot say.

When once acclimatised, this Cockatoo is vigorous, and lives to a good age in captivity. With care and attention it can be taught to speak various words, and even short sentences; but of the many which I have met with, very few get beyond the tiresome word "Polly," which people will persist in teaching every kind of talking Parrot.

This bird was bred near Berlin, in a garden, in 1883. The young were fed by their parents chiefly upon white bread and yolk of egg. When being fed they kept up a continuous sound like that produced by rubbing a cork upon a bottle. They left the nesting-hole when eleven weeks old, being then but little smaller than their parents.

Although owners of these birds always speak of them as gentle and innocent, I have often observed that directly you approach to scratch their heads they throw their crests forward, open their formidable beaks, and look so menacing that discretion has always seemed to me the better part of valour.

In my "Foreign Bird-Keeping," Vol. II., p. 31, I published an account of an unusually accomplished specimen of this bird, which belonged to my wife's grandmother; I see no use in repeating it here. Parrots repeat what they are taught, and a few words or sentences which they pick up for themselves; in some instances they acquire a certain comprehension of the meanings attached to their utterances, and therefore astonish their hearers by the appropriateness of their remarks, but in some cases they jumble words together so that they make no sense whatever.

I remember, when a boy, seeing one of these birds, which had escaped from a cage on the balcony of a neighbour's house, flying high over our garden screaming at the top of its voice; it was soon out of sight, and I believe was never recovered. Specimens purposely turned loose in the country have lived for a year or two in freedom, coming down to feed with fowls in the winter-time; but doubtless such conspicuous birds get gradually shot by keepers and others; perhaps it is just as well for fruit-growers that this should be so.

This Cockatoo was first exhibited at Regent's Park in 1860, since which time the London Zoological Society has owned a good many dozen examples of the bird; doubtless, in like manner, it has been freely represented in all other Zoological Gardens; it is very enduring, living to fifty, eighty, and perhaps over 100 years.*

Triton Cockatoo (*Cacatua triton*).

Closely related to the preceding, but smaller and with the naked orbital skin blue; beak and feet black; irides brown. Female smaller than male, with smaller beak, narrower when seen in profile, and with a shorter terminal hook. Hab., Papuan Islands.

In a paper on the "Birds of North Queensland" (*The Ibis*, 1900, pp. 642, 643), Messrs. Robinson and Laverock regard this as a mere form of the preceding species, and quote Olive's note on its habits as follows:—"Plentiful, but very shy; generally in flocks, but sometimes in pairs and singly. I have counted nearly 200 roosting in the trees close together; in the morning they separate and go out in small flocks to their feeding-grounds and return to their roosting-place after sunset. They nip off all the leaves and smaller twigs from the trees on which they roost. Iris brown, feet and bill black; bare skin on the face *bluish white.*"

The authors of the article point out that these northern birds much more closely resemble those of New Guinea (the typical *C. triton*) than do the South Australian examples, and they point out that Salvadori refers an example collected at Hammond Island, Torres Straits, to *C. triton;* still, the field-note would have been more satisfactory as applying to the latter species if it had been made in New Guinea. Dr. Hartert, so far from regarding *C. triton* as a form of *C. galerita*, has strongly advocated its separation into three subspecies, on account of their differences in size. On the other hand, Count Salvadori says (*The Ibis*, 1906, p. 128):—"I should say that *C. triton* is a very variable species as regards dimensions." What earthly good species-splitters expect to do to science by naming all the links between continental and insular forms or all the gradations in size or tint of the same species when occupying a large area, I utterly fail to see. We know that it was a fact recognised by Darwin that "common and widely distributed species vary most"; therefore the commoner and better known a species is, the more are we to be plagued with a multiplicity of names for it, when one name and a statement of the nature of its variability would answer all scientific purposes.

The London Zoological Society first acquired a specimen of *C. triton* in 1860, and various others were placed on exhibition from that date, though mostly on deposit; the last recorded in the ninth edition of the list was one presented in 1893.

Lesser Sulphur-crested Cockatoo (*Cacatua sulphurea*).

Considerably smaller than *C. galerita*, generally yellower in tint, and with a defined yellow patch on the ear-coverts, the wing and tail feathers yellow below; the feet blackish-grey with black claws; the iris dark brown in the male, but said to be reddish-brown in the female (as very likely to be the case in *C. galerita*). Female slightly smaller than male; the beak viewed from above rather shorter and narrower, the terminal hook shorter. Hab., Celebes, Buton, and Togian Islands.

It is probable that the wild life of this bird greatly resembles that of its larger relative; it certainly lays two eggs, as shown by Mr. Fraser (P.Z.S., 1865, p. 227), who also pointed out that hens of this and other Cockatoos were good talkers.

Dr. Russ speaks of the Lesser Sulphur-crest as becoming "easily and quickly tame, exceedingly confiding, never treacherous or snappish; also vigorous and enduring, nevertheless, it only learns to speak certain words." This is exactly the opinion which I have formed of the bird from the examples with which I have come in contact. A neighbour had one for several years which could be heard at intervals of a minute or so throughout the day, "Ma-rie"—it never said anything else; but at times it relieved the monotony of its existence by shrieking after the fashion of its kind. I was asked whether I wouldn't like to have the bird (when my neighbour moved), but I declined with thanks; a bird so accomplished seemed to me dear as a gift.

Lemon-crested Cockatoo (*Cacatua citrino-cristata*).

White, base of feathers of head, neck, and inner web of flight and tail-feathers sulphur-yellow; crest yellowish-orange; ear-coverts tinged with yellow; naked orbital ring whitish-grey; beak and feet black; irides dark brown. Female not differentiated, but pro-

* See *The Ibis*, 1899, p. 31.

bably smaller and with shorter, narrower beak. Hab., Sumba.

Doubtless the wild life is similar to that of allied species, but I have not come across any published notes dealing with it. All that Russ tells us in his "Handbook" respecting this Cockatoo is that it is much rarer than *C. sulphurea*, and the price higher. It first reached the London Zoological Gardens in 1855, and several other examples were received in later years, all apparently from Timor Laut.

Leadbeater's Cockatoo (*Cacatua leadbeateri*).

White, the feathers of the forehead rosy at the base, the crest (which consists of sixteen acuminated feathers curled forwards at the tips) is orange-vermilion at the base, yellow in the centre, and white at the tip; the sides of the head, neck, breast, and abdomen are washed with rosy, the rose-colouring being brightest under the wings and at the base of the inner web of the tail-feathers. The beak is pale yellowish horn-coloured, the cere and nostrils covered with rosy feathers; the feet brownish-grey, with the scales and claws black; the naked skin round the eye whitish; iris, black, the dark-eyed ones being the males. Female smaller, with brownish iris; with more coarsely-formed beak; the upper mandible broader, and with shorter terminal hook. Hab., "South Australia, from New South Wales, through the interior to Victoria and S.W. Australia" (Salvadori.)

According to Mr. K. H. Bennett, who discovered this bird breeding plentifully in the interior of New South Wales, it nests during August, September, and October in the hollow limbs of trees, usually of a lofty eucalyptus, and lays three white eggs to the clutch. The note of the bird, as Gould observes, is more plaintive and less grating than that of *C. galerita*.

In captivity, Leadbeater's Cockatoo, though perhaps somewhat less active than the preceding species, is tolerably amiable, tame, and enduring. It is a favourite show-bird, which has often been exhibited at the Crystal Palace and elsewhere; and when, from time to time, I have visited Mr. Housden, of Sydenham, I have generally seen the species represented in his collection of living birds. I have always considered it by far the most beautiful of the Cockatoos.

Greater White-crested Cockatoo (*Cacatua alba*).

White, including the crest; base of inner webs of flight and tail feathers sulphur-yellow; naked orbital skin bluish-white; beak and feet black; irides red or dark olive. Female with the culmen of the beak much narrower and less arched than in the male, the terminal hook (seen in profile) narrower towards its base. Hab., Halmahera group of islands.

Dr. Guillemard says ("Proceedings of the Zoological Society," 1885, p. 562) that the iris of the Batchian birds is blue, of the Obi examples red; in all the individuals the bare space round the eye was yellowish. It would therefore seem that the colouring of the soft parts indicates various constant local races such as nowadays are distinguished by cabinet-ornithologists as sub-species.

Dr. Guillemard observes that "this species has the same habits as the representative *C. triton* of the Papuan islands, screaming noisily at sunset round the tops of the highest trees."

Russ remarks ("Handbook," p. 252):—"Can learn to talk better than others. According to Lord Burton (who bred hybrids between this and the Leadbeater Cockatoo flying at liberty in a park), the most gifted, or, at least, the cleverest of all the Cockatoos. Mr. Blaauw, however, speaks of it as the most fearful screamer of them all. Rare in the trade. Price, from 36 to 75 marks for a specimen."

First purchased for the London Zoological Gardens in 1861, since which time a fair number of specimens has been added to that collection.

Blue-eyed Cockatoo (*Cacatua ophthalmica*).

White; base of inner webs of flight and tail-feathers tinged with sulphur-yellow; long inner crest-feathers yellow; naked orbital skin blue; beak black; feet dark grey; irides dark brown. Female probably differing as in the preceding species. Hab., New Britain (recorded in the Zoological Society's list as from Solomon Islands).

Dr. O. Finsch, writing from New Britain (*The Ibis*, 1881, p. 538) says:—"The nestling of *Cacatua ophthalmica* wears the same colours as the old bird; long before the tail-feathers are fully grown the yellow pendant crest is developed in the same style as in its parents."

Layard states that it is very abundant in New Britain, and is killed in great numbers by the natives and made into a very tasty soup. Russ says that it is very rare in the trade, valued preferably when a clever talker; price always high.

The London Zoological Society purchased the first two examples exhibited at the Gardens in 1862; two others were secured in 1865, and others have been acquired since that date.

Rose-crested Cockatoo (*Cacatua moluccensis*).

White with a rosy tint; inner webs of flight and tail-feathers tinged with buffish-yellow; inner long feathers of crest edged with orange-vermilion; naked orbital skin bluish-grey; beak black; feet dark grey; irides dark brown. Female not differentiated, probably with shorter, thicker beak. Hab., Ceram and Amboyna.

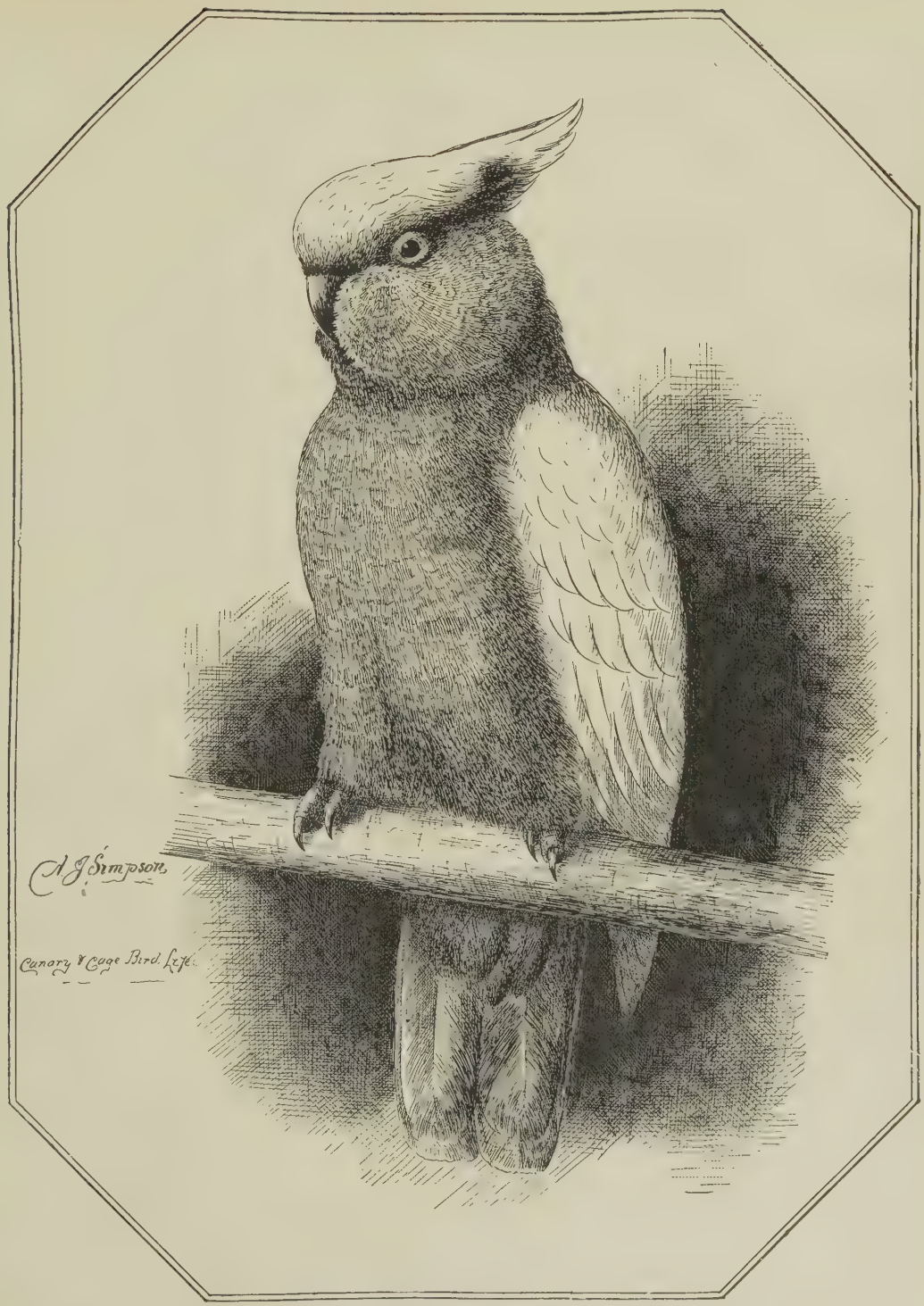
In an article on the duration of life of animals in zoological gardens ("Proceedings of the Zoological Society," 1880, p. 309) Dr. Max Schmidt gives the longest life of this species as twenty years five months and sixteen days; which is a greater age than that attained by other Cockatoos known to him as living under similar conditions. But we know that the Greater Sulphur-crested Cockatoo in the hands of private owners has attained to a considerably greater age—from fifty to eighty-one years according to Gurney (*The Ibis*, 1899, p. 29), while a Cockatoo is said to have lived once to 120 years (*Land and Water*, 1870.)

In an article on Birds from Ceram ("Proceedings of the Zoological Society," 1882, p. 701) Dr. W. Blasius describes two pairs as having the iris dark brown; bill and feet grey-black; skin round eyes milk-white. He says also:—"Both the males have the red of the crest-feathers of a more vivid colour, and the white of the feathers of belly and back a little more tinged with rose-colour than in the females."

I have found no information respecting the wild life in any work in my library, but as Dr. Russ says that they are taken in numbers from the nest and hand-reared, it is certain that it must be known if not recorded; probably the habits of this species do not differ from those of other white Cockatoos.

This species when reared from the nest is said to be amiable, clever, and readily taught to talk and whistle tunes; moreover, when once tamed it is asserted that it ceases to scream; if, however, adult birds are caught and caged they remain wild, untamable, and irritating screamers.

Russ says that Dr. Platen brought home twenty specimens, but otherwise it is not abundant in the market;



LEADBEATER'S COCKATOO.

the price fluctuates to an extraordinary degree from 30 to 40 marks, but more often from 80 to 150 marks for one specimen. It is probable that in England it is more reasonable, since very many specimens have been exhibited since 1855 in the Gardens at Regent's Park.

Bare-eyed Cockatoo (*Cacatua gymnopis*).

White; the feathers of the head, hind neck, and abdomen stained at the base with rose; flights and inner webs of tail-feathers pale yellow; forenead and lores stained with red; orbital naked region blue and forming a large patch under the eye; beak whitish; feet bluish; irides dark brown. Female apparently with the beak broader, more arched, and with shorter and thicker terminal hook. Hab., Southern, Northern, and North-Western Australia.

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," p. 613) thus describes the nidification of this Cockatoo:—*Nest.*—A hole or hollow in a tree. *Eggs.*—Clutch, four; roundish in form; texture somewhat coarse; surface glossy and minutely pitted; colour, white. Dimensions in inches of a pair from the Barrier Range (New South Wales): (1) 1.5 × 1.18, (2) 1.45 × 1.12."

This species first reached the London Zoological Gardens in 1871, since which date other examples have been exhibited there. Russ says that since 1877 single examples have been not infrequently received by the wholesale dealers of London and Hamburg, and generally advertised as talkers. He states that the cry is a long-drawn Owl-like call, but only uttered in the evening and during flight. He considers it one of the most charming and most gifted of all the Cockatoos.

Blood-stained Cockatoo (*Cacatua sanguinea*).

White; base of inner webs of flight and tail feathers clear sulphur-yellow; base of lores and sides of face stained with blood-red patches; naked orbital ring white; beak yellowish-white; feet nearly brown; irides dark brown. Female with shorter and broader beak, with coarser terminal hook. Hab., "Australia: N. Coast, New South Wales, Interior." (Salvadori.)

Gould remarks ("Handbook," Vol. II., p. 7):—"That no bird is more common on the Victoria is certain, for Mr. Elsey informed me he saw it there in flocks of millions.

"The Blood-stained Cockatoo inhabits swamps and wet grassy meadows, and is often to be seen in company with its near ally, the *Cacatua galerita*, but I am informed it is even more shy and difficult of approach than that bird. It is doubtless attracted to the swampy districts by the various species of orchidaceous plants that grow in such localities, upon the roots of which at some seasons it mainly subsists."

Mr. A. J. Campbell ("Nests and Eggs," pp. 614-617) gives a very full account of the species, from which I quote the following:—"Mr. Herbert Kenny, while at Cooper's Creek, wrote me: 'At times the Blood-stained Cockatoos are to be seen in immense flocks. In the season you may see the blacks bringing home their dilly bags full of eggs and young ones of all sizes, from those just out of the shell to fully-fledged ones.' Mr. Kenny sent me a set of eggs with the following interesting data: 'Eggs of Blood-stained Cockatoo taken from gum tree in Innamincka water-hole, Cooper's Creek, within a few yards of spot where Burke, the explorer, perished. The nest contained four eggs, which varied in size. Taken 17th August, 1899. Saw blacks with eggs latter end of July.'

"Far north Blood-stained Cockatoos resort to the holes of the coolibar, or flooded box (a species of eucalypt), the principal tree in the district. After a certain age the young are left during the day, and are fed at evening, when the congregation of birds returns from the plains. The young are then fed in the usual Cockatoo manner, by the parent birds pumping half-digested food from their crops into the young ones' mouths."

Mr. Campbell thus describes the nest and eggs: "*Nest.*—In a hole in a tree; sometimes in timber standing in a lagoon or swamp. *Eggs.*—Clutch, three to four; oval inclined or roundish in shape; texture of shell somewhat coarse; surface glossy, in some examples rough, with limy nodules; colour, white. Dimensions in inches of a clutch from Cooper's Creek (South Australia): (1) 1.44 × 1.08, (2) 1.4 × 1.07, (3) 1.33 × .98; of a pair from the Gulf of Carpentaria district: 1.6 × 1.14, (2) 1.45 × 1.09."

This species was first purchased by the London Zoological Society in 1865; but, in spite of its abundance in its native haunts, it is rarely seen in the European bird-markets, and naturally fetches a high price. In the ninth edition of the Society's List I see that an example was purchased in 1885. See, however, the next species.

Goffin's Cockatoo (*Cacatua goffini*).

Smaller than the preceding species; the orbital naked skin white tinted with blue; beak pale blue; feet dirty blue; irides light red. Female smaller than male, the beak longer and with more slender terminal hook.* Hab., Tenimber Islands.

Doubtless the wild life of this bird would nearly resemble that of *C. sanguinea*. According to Russ it is far-famed as gentle, peaceable, charming, clever and also learned in imitating words, whistling, and mimicry of all possible sounds, though some say it is an aggravating screamer, whilst others say it is not gifted as a talker, but does not scream. Russ gives its price in Germany as from £5 to £7 10s. per specimen.

In the earlier editions of the Zoological Society's "List of Animals," *C. goffini* is said to be from Queensland, several examples having been acquired between 1862 and the issue of the eighth edition; the question is whether these ought not to have been referred to *C. sanguinea*. In the ninth edition five examples are enumerated, from the correct locality—Timor-Laut, the first three of which were deposited in 1883.

Ducorps' Cockatoo (*Cacatua ducorpsi*).

Differs from *C. sanguinea* in the absence of red markings from the face, which is wholly white; the crest-feathers reddish-orange at base with a tinge of lemon-yellow; orbital skin nearly circular, pale blue; beak and feet grey; irides brown. Female with smaller and narrower beak. Hab., Solomon Islands.

I have found no notes on the wild life of this Cockatoo. It was first purchased for the Regent's Park Gardens in 1864, and in 1871 a third example was presented; others were received later. Russ speaks of it as rare, and gives its price as from 60 to 100 marks (roughly £3 to £5); he says that several examples in the hands of aviculturists have laid eggs in captivity, but this is not unusual with female Parrots; its behaviour is said to resemble that of Goffin's Cockatoo.

Red-vented Cockatoo (*Cacatua hæmaturopygia*).

White; inside of crest tinged with sulphur-yellow or with very pale vermilion; ear-coverts washed with rose-pink; under tail-coverts pale vermilion with white edges; wings and tail beneath sulphur-yellow, brighter

* The sexed female in the British Museum collection also has the head, throat, and breast white, the crest slightly yellowish; but possibly these colour differences may not be constant.

Red and Blue Macaw. Blue and Yellow Macaw.

Slender Bill Cockatoo.

on tail; naked orbital skin white; beak lead-colour tipped with yellowish; feet dark lead-colour; irides dull carmine. Female with beak (seen from above) narrower to beyond the middle, but with shorter and broader terminal hook. Hab., Philippine and Sula Islands.

Mr. J. Whitehead (*The Ibis*, 1899, p. 396) says: "Met with throughout the entire archipelago, but, curiously enough, we never noticed a single Cockatoo in the valley of the Rio Grande. During our expedition to the Province of Isabella, the natives told me that this species was not known to them; and also during my trip to Cape Engano in the north-east of Luzon, we found it absent. So perhaps this species does not pass the high mountains which divide Luzon at 16 deg. longitude." He does not describe the wild life of the bird.

Four specimens of this species were purchased for the London Zoological Gardens in 1865, since which date others have been added from time to time. Russ says it becomes very tame, but talks little, and screams horribly; is one of the rarest in the market and its price is from 75 to 100 marks.

ROSE-BREASTED COCKATOO (*Cacatua roscicapilla*).

"Crown of the head pale rosy-white; all the upper surface grey, deepening into brown at the extremity of the wings and tail, and becoming nearly white on the rump and upper tail-coverts; sides of the neck, all the under surface from below the eyes and the under surface of the shoulders, rich deep rosy-red; thighs and under tail-coverts grey; irides, "rich deep rosy-red"; orbits, brick-red; bill, white; feet nearly dark brown." According to Campbell the irides of the male are black. Female with the irides pearl-coloured; the form of the beak probably differs as in the preceding species. Hab., Australia.

According to Gould the colouring both of the grey and rose-red is darker in examples from New South Wales than in those from the North Coast. He speaks of this bird as feeding on the plains bordering the river Namoi in flocks of from fifty to two hundred individuals. It is strong on the wing, and the effect of the change of flight showing first the grey of the backs and then the rose red of the under parts is described as very beautiful. It breeds in holes in the tall eucalypti, laying three white eggs.

Campbell ("Nests and Eggs," p. 617) thus describes the nidification: "*Nest.*—Within a hole in a tree, usually near or standing in water. *Eggs.*—Clutch, four to seven, but usually five; round-oval in shape; texture of shell comparatively fine; surface slightly glossy, occasionally with limy nodules;* colour pure white. Dimensions in inches of a pair: (1) 1.4 × 1.04, (2) 1.39 × 1.06; of a rounder pair: (1) 1.35 × 1.09, (2) 1.34 × 1.08."

On page 618 he says: "The nesting places of the Rose-breasted Cockatoo or Galah are easily found, because the bark surrounding the hole is peeled off all round for some distance. Trees near the nest are often similarly marked by the birds. The young are fed by their parents long after the former have quitted their nests."

No Cockatoo is probably imported in greater numbers, or offered at so moderate a price, as this one. In Australia, where it is popularly known by the name of "Galah," it is made much of by sheep-farmers and settlers, who take great trouble in teaching it to talk. It is frequently allowed partial liberty, and feeds with the poultry and pigeons. I am informed that some of the individual birds kept in isolated farms are very accomplished talkers, but in Europe the Roseate Cockatoo is not considered at all gifted in this respect; indeed, although I have at various times stood by the cages of some dozens of examples of this species, I can honestly affirm that never yet have I heard anything but the most irritating shrieks from this noisy creature. I think it probable that those examples which have been taught to talk in this country have been taken from the nests and hand-reared, for it is not in the least likely that birds caught when adult would ever be teachable, since that is the case with other Cockatoos which are more talented by nature.

Dr. Russ speaks of the Rose-breasted Cockatoo with much affection. He admits that it is not a distinguished speaker, nor even the most gifted Cockatoo; but he admires it for its wisdom, drollery, the ease with which it can be tamed, and its amiability. He says it will lie on its back and play with a bit of wood or the like, will turn somersaults and do other tricks; moreover, when, as a jest, he nips his master in the ear or nose, he never injures him. According to his admirer, as the bird gets tamer it becomes less objectionable in the matter of shrieking. This is undoubtedly the case with other kinds of Parrots.

SLENDER-BILLED COCKATOO (*Licmetis nasica*).

White is its prevailing colour, the lores and forehead being red, the bases of the feathers on the head, neck, and breast being also red, which colouring can be traced through the white of the overlapping feathers; wing and tail below washed with sulphur-yellow; beak bluish-white, the sere and nostrils hidden by little rose-red feathers; feet blue-grey, the scales and claws blackish; naked skin round eye, pale blue, iris dark to light brown. Female with distinctly shorter, broader, and coarser beak than in the male. Probably the lighter iris will prove also to be a female character. Hab., Australia, from the Gulf of Carpentaria, through the interior to New South Wales and South Australia.

Mr. Gould says of this species: "Like the *Cacatua galerita*, it assembles in large flocks, and spends much of the time on the ground, where it grubs up the roots of orchids and other bulbous plants, upon which it mainly subsists, and hence the necessity for its singularly-formed bill. It not infrequently invades the newly-sown fields of corn, where it is the most destructive bird imaginable. It passes over the ground in a succession of hops, much more quickly than the *Cacatua galerita*; its powers of flight also exceed those of that bird, not perhaps in duration, but in the rapidity with which it passes through the air.

"The eggs, which are white, two in number, and about the size of those of *Cacatua galerita*, are usually deposited on a layer of rotten wood at the bottom of holes in the larger gum trees."

Some years ago I purchased an example of this bird for a sovereign, as its owner wished to part with it. The bird was particularly amiable and gentle, but irritating from the fact that it could only say one sentence, which it repeated at short intervals throughout the day: this sentence—"Hullo, old Cocky-waxy!"—was also not even instructive. When, therefore, at the end of a week I heard of a lady who wished to purchase it for just double what I had given for it, I naturally accepted. I heard afterwards that, under the impression that the upper mandible was a monstrous growth, she had it trimmed down to resemble that of other Cockatoos. To my mind it certainly is a very ugly bird, its elongated upper mandible giving it a hideously deformed appear-

* This is the case with many species in which the eggs are usually smooth; I have found it not infrequently in eggs of the European Blackbird.—A. G. B.

ance. The Corella, as it is called in Australia, is tolerably freely imported, and not excessively dear.

In captivity Gould speaks of this bird as dull, morose, and irritable. Most of those that I have seen looked just about as interesting and stupid as Owls. Russ evidently thinks well of the species; he says that usually it only learns single words, but some examples are extraordinarily gifted with speech. Captured when adult, they are obstinate, difficult to tame, easily disturbed, yet not really malicious, sometimes frightful screechers. Taken young they are altogether tame and trustful. He then speaks of a tame pair which used to accompany their master on his walks, flying from tree to tree, but coming to him when called, and allowing him to caress them. The male, being pursued by a Hawk, flew spirally so high that it could no longer be seen, and escaped its hunter.

There is not the least doubt that the sulkiness and ill-temper frequently noticeable in specimens of this species is due to their having been netted when adult.

Campbell gives the number of eggs to a clutch as one to four, but usually two to three. As will be seen, this differs a little from Gould's statement.

Dampier Cockatoo * (*Licmetis pastinator*).

A little larger than the common Slender-billed Cockatoo, the naked orbital space larger and darker, of a bluish lead-colour. The female probably differs from the male as in the preceding species. Hab., Western Australia.

Both Gould and Salvadori agree that the characters which distinguish the two Slender-billed species are far more apparent in living examples than in the dry skins.

Mr. A. J. Campbell observes ("Nests and Eggs," pp. 620, 621): "This species is probably the oldest-known Australian Cockatoo, for when the navigator Dampier, in August, 1699, was off the western coast, he saw birds flying from the mainland over to islands which form the archipelago now bearing his name, and recorded there was a 'sort of white Parrot which flew a great many together.' A correspondent on the western coast informs me the Cockatoos still fly 'a great many together' in August and September to breed on the islands, where they nest in the holes and crevices of rocks. However, in the season of 1891, on account of the prevailing drought, they did not visit the islands as usual. Near Point Cloates, the Western Long-bills are said by the natives to breed in numbers in the cliffs on the sea-coast, where a water-hole is situated. Mr. Tom Carter has observed birds passing over from inland towards that direction. He also states they breed in numbers in the hollow stems of mangrove trees on the islands in Exmouth Gulf.

"The first authenticated eggs of this species were three in number, taken by Mr. Carter on September 22, 1888, from the hollow spout of a gum tree on the Minilga River."

The eggs are thus described: "Clutch, three to four; oval or round-oval in shape; texture of shell comparatively fine, surface glossy; colour, pure white, more or less stained with the dust of the nest. Dimensions in inches of a pair: (1) 1.63 × 1.15, (2) 1.52 × 1.14."

First presented to the London Zoological Gardens in 1858, since which time a fair number of specimens has been exhibited there.

* In the Zoological Society's list this is called the Western Slender-billed Cockatoo, and I adopted that name in "How to Sex Cage-birds," but the Australian name is shorter and therefore preferable.

Cockateel * (*Calopsittacus novæ-hollandiæ*).

General colour of upper surface deep ash-grey, below slightly paler; a broad curved belt of white runs from the shoulders over the greater wing-coverts; the face and crest of the cock bird are bright lemon-yellow, a large orange patch being placed on the cheek behind the eye. In the hen the face is greyish, but still with a slight yellowish tint, and the orange patch is duller. The under surface of the tail in the cock is black, but

The Cockateel.

in the hen it is mottled and banded with yellow, and the upper side of the tail in this sex has also a faint banded appearance; the legs and beak are grey, and the iris of the eye is hazel. Hab., Australia generally.

Gould says of this species ("Handbook," Vol. II., pp. 84, 85): "It would appear to be more numerous in the eastern division of Australia than in the western. During the summer of 1839 it was breeding in all the apple-tree (*Angophora*) flats on the Upper Hunter, as

* The name is usually spelt "Cockatiel," but I have followed the more natural spelling adopted by the Zoological Society.

well as on all similar districts on the Peel and other rivers which flow to the north-west. I have seen the ground quite covered by them while engaged in procuring food, and it was not an unusual circumstance to see hundreds together on the dead branches of the gum trees in the neighbourhood of water, a plentiful supply of which would appear to be essential to their existence.

"The flight of the Cockatoo-Parrakeet is even and easy, and is capable of being long protracted. When it rises from the ground it flies up into the nearest tree, almost invariably selecting a dead branch, upon which it frequently perches lengthwise. It is by no means a shy bird, and from the circumstance of its being excellent eating many are killed for this purpose by persons leading a bush life.

"It breeds in the holes of gum and other trees growing in the neighbourhood of water. The eggs are white, five or six in number, 1in. long by ¾in. broad."

Campbell says: "*Eggs.*—Clutch, four to seven, usually five"; but he tells us that "occasionally more than one pair of birds breed in the same tree." I should think hardly in the same hole, when one sees how quarrelsome they often are in the breeding season. In its wild state it is said to produce only two broods in the year, but, like many other Australian birds, when kept in an aviary, its fecundity seems to be greatly increased; at the same time, I found my first pair much more inclined to breed during the winter than the summer months in an indoor aviary, though they never got beyond eggs.

This pretty species has a crest somewhat similar to that of the Lemon-crested Cockatoos, but the bird has not the same power of depressing it, although when excited he can bring it more forward.

The best contrivance for nesting purposes I found to be the ordinary log-nest; boxes with a hole at one end, and with an inch or two of sawdust in the bottom, have been recommended (see "Hints on Cage-Birds," p. 39), and my friend Mr. Seth-Smith succeeded best with these; but though I tried one in my Parrakeet aviary the hen Cockateel would not lay in it, but dropped her eggs anywhere in preference; in the log-nest she laid four eggs, evidently at intervals of several days, and sat upon them steadily every night, the cock taking his turn by day; but, for some reason or other, they did not hatch out, though all were fertile, the eldest having rotted in the shell, the second died when ready to hatch, the third when half developed, and the fourth when just beginning to solidify. The mother was evidently out of health, and one evening she refused to go on to the eggs, although her husband did his best to persuade her to do so; on the following morning she suddenly fell to the floor of the aviary in a kind of a fit, and when picked up by a man who chanced to be in the house, and wished to put her back on a branch, she struggled and bit so savagely that he let her slip through his hands with the loss of her tail; the next day she died, and I opened the eggs, which were then all cold. I purchased what was believed to be another hen, but it shortly developed the cock plumage, and the quarrels between the two birds were so incessant and so terrified my Budgerigars that I got rid of them. At the end of 1905 I exchanged a cock Wonga-Wonga Pigeon with Mr. Thorpe for two pairs of Cockateels, and turned them into one of my bird-room aviaries, where they quarrelled a good deal. I again supplied a box, a log, and various large receptacles of the cigar-box pattern. (See "Hints on Cage-Birds," p. 41.) Throughout 1906 many attempts were made at breeding, most of the eggs being dropped from the branches and broken, but one or two being laid first in one box, then in another, but never incubated. Finally the hen of the stronger pair died on March 18, 1907, egg bound; she had been weakened by incessant laying. I therefore removed the cock to a cage, leaving one pair in the bird-room. The latter continued to waste their energies until about the middle of June, when they finally selected a cigar nest-box in which to lay. Early in July I heard a young bird being fed, and finally this one left the nest. The parents continued to feed it for about a month after it flew, although it was well able to cater for itself. Unfortunately it proved to be a cock. In 1908 I turned all four into a small aviary which had been recently enlarged, and there they are as I write.

Pretty and easy to breed in an outdoor aviary as the Cockateel is, I cannot say that it is a favourite of mine; a rapid runner, noisy flier, and hard biter; the cock bird is a great chatterer; the song is varied to some extent, but each phrase is repeated many times. One very frequent utterance seemed to be an obsession with my birds one day when my grandson was present, and he asked me, "Grandpa, what are those birds saying?" "Listen!" I replied. "Here you're coming! Where are you going!" "Yes, grandpa, that's just what they are saying." And when such a senseless jingle is reiterated for about ten minutes without cessation it becomes tiresome. At times the utterance bears a strange resemblance to its own name in a harsh whistle, *cockacheea*; at others it sounds like "Very poorly, pooly, pooly, pooly." A cock bird of this species, if brought up from the nest, has been known to learn a few words, or even short sentences; he then makes a very nice cage pet; but in an aviary he makes too great a disturbance amongst his smaller cousins.

CHAPTER X.

PARROT-LIKE BIRDS (*Psittacidæ*).

This is the largest, most widely distributed, and most difficult to characterise of all the families of Parrots: it has been sub-divided into six sub-families:—*Nasiterninæ*, containing *Nasiterna* (a genus of spine-tailed Parrots); *Conurinæ*, including the Macaws, Conures, Passerines, and a few allied forms; *Pioninæ*, comprising the Amazons, Caiques, and a few others; *Psittacinæ*, to which group the Grey Parrot and other African types belong; *Palæornithinæ*, including the Eclecti, the various Ring-necked and other allied Parrakeets, the Love-birds and Hanging-Parrakeets; *Platycercinæ*, which includes the Broadtails, Grass, and Ground Parrakeets. The lovely little Pigmy Parrots (*Nasiterna*) appear to have never been imported alive, although in 1908 Mr. Walter Goodfellow had twelve examples of the most beautiful species (*N. bruijni*), but had to release them because he had run short of seed on which to feed them during the journey home. They are among the tiniest of Parrots, the largest being only 4in. in length; all are brightly coloured. Doubtless these birds will be imported, but it is probable that only public institutions or the very wealthy will ever have the pleasure of keeping them.

Macaws, Conures, &c.

(*Sub-Family Conurinæ*).

The *Conurinæ* are mostly brilliantly coloured birds, with very powerful beaks, deeper than long, the hook

of which has a file-like surface on its lower side: the culmen either flattened and grooved or rounded and smooth; the cere forming a band round the whole base of the beak; the orbital ring frequently complete. Excepting in the genus *Psittacula* the sexes are much alike. The sub-family is represented in the New World from Carolina to Patagonia.

Macaws.

The Macaws are birds of large size, and, in spite of their gaudy colouring, their huge punchinello-like beaks give them a somewhat unpleasing appearance. They have long graduated tails, the feathers of which taper to a point, the two central ones being the longest. In captivity they are generally attached to Parrot-stands, with food at one end and water at the other of the perch; but, to see them to advantage, the canal aviary at Regent's Park is most suitable. Although they bear a good character for intelligence and general amiability, they should never be implicitly trusted. I have known one (for a very slight cause) to inflict a vicious and very severe bite upon its master, which might indeed have cost him a finger. Macaws are, to me, the least attractive of all *Psittaci*: they are too large for a cage, too powerful to handle with perfect safety, they are frightful screechers, not cleanly, and their colouring is too loud to be restful. On the wing, in their native haunts, I have no doubt these gaudy monsters harmonise with their surroundings, but nowhere else. They should be fed principally on dry seeds: maize, oats, sunflower seeds, hemp, and canary, also a plain dry biscuit from time to time, as well as raw carrot and ripe fruit. The stupid notion that these and other parrots do not require anything to drink should be ignored, for though with the help of plenty of luscious fruit it may be possible to keep the poor things alive for years, a perpetual raging thirst cannot be calculated to improve their condition of health or temper.

Hyacinthine Macaw (*Anodorhynchus hyacinthinus*).

The adult bird is cobalt-blue, slightly paler on the head and neck, and duller below than above; the base of the inner webs of the flights and the underside of the wing and tail feathers black; the beak black, with the lower mandible yellow at the base; the feet blackish, the naked skin round the eyes yellow, the iris brown. The female is probably rather smaller than the male, with a smaller, shorter, and perhaps narrower beak. Hab., Central Brazil and Mattogrosso.

Burmeister says of this bird: "It is less shy than the blue and yellow Ara, but is nowhere so abundant or met with in such numerous flocks. According to Aug. de St. Hilaire, one invariably only sees it in pairs. The same observer is certain that this species properly bears the name Ararauna among the natives."*

There can be little doubt that, as is the case with Macaws generally, this bird lays two or three eggs, but from books at my disposal I have not been able to obtain much information as to its wild life. Not being a very common bird, even on the Amazon river, it is not surprising that it is not very freely imported, and consequently commands a high price. Russ speaks of it as having only been seen occasionally in zoological gardens, but the Hon. and Rev. F. G. Dutton says that he has possessed one, and most bird-lovers in this country will remember the fine specimen formerly belonging to Mr. Fulljames. The latter gentleman spoke of the bird as perfectly amiable to its keeper, but spiteful to strangers. The first example exhibited at the London Gardens was purchased in 1867, since which date other examples have been acquired.

* Bates also mentions this as its native name.

Lear's Macaw (*Anodorhynchus leari*).

Cobalt-blue; back, scapulars, and wing-coverts with narrow paler edges; flights blackish-grey towards base of inner webs; head, neck, and under surface greenish-blue; the feathers of the abdomen with bluish-green edges; greater under wing-coverts and flights below blackish-grey; tail below black; naked orbital ring orange-yellow; a large patch behind lower mandible yellow; beak black; feet blackish; irides brown. The female probably differs in the usual way. Hab., South America (exact locality unknown).

The Rev. H. D. Astley has published an account of three examples of this bird which he possessed, illustrated by a coloured plate, in *The Avicultural Magazine*, Second Series, Vol. V., pp. 111-113. He says it "is naturally a bird with a kindly disposition," and "the Lear's Macaws can make themselves heard, no doubt about that, but it is a voice of a much less strident ear-piercing tone than that of the vari-coloured large Macaws. It has more of the Carrion-Crow 'timbre' in it."

The first example received by the London Zoological Society was purchased in 1860, and others have since been received, but it seems to be rarer than the preceding species.

Glaucous Macaw (*Anodorhynchus glaucus*).

Greenish-blue; flights blackish towards base of inner web; head and neck somewhat greyish; cheeks, throat and front of breast somewhat brownish; under-surface greener; the greater under wing-coverts and under surface of flights and tail-feathers blackish; naked orbital skin and patch behind lower mandible yellow; beak black; feet blackish; irides probably brown. Female slightly smaller, with shorter beak and shorter terminal hook. Hab., Paraguay, Uruguay, and Southern Brazil. I have been unable to find any notes on the wild life of this bird in any book in my library. Burmeister tells us nothing about it.

This rare Macaw did not reach the London Zoological Gardens until 1886. Oddly enough, Russ only speaks of it as being as rare in the trade as *A. hyacinthinus*, price equally high, only in the case of freshly-imported specimens at 350 marks (he gives 600 to 750 marks as the price of *A. hyacinthinus*). I wonder if any German aviculturist ever gave as much as £37 10s. for a Hyacinthine Macaw!

Spix's Macaw (*Cyanopsittacus spixi*).

The colouring is blue, the head and neck being somewhat greyish; the feathers of the back, upper wing-coverts, rump, upper and under tail-coverts with paler margins; flights with blackish inner webs; breast and abdomen slightly greenish; wings and tail below blackish. Feet blackish; naked lores and skin round eyes black; iris pale yellow.*

The female is a little smaller than the male, and has a narrower and smaller beak, with shorter terminal hook. Hab., Province of Bahia.

I can discover nothing as to the wild life of this species from books in my library.

A good illustration, taken from a living example,

* Burmeister describes the lores and cheeks as quite naked, and yellowish white; Dr. Sclater says that the lores and skin surrounding the eyes are black.

purchased by the Zoological Society, is published in their "Proceedings" for 1878. It was the first example that Dr. Sclater had ever seen alive. Writing in *The Avicultural Magazine* in 1897, the Rev. F. G. Dutton says that he has only seen two (one of them being the above-mentioned bird), and he found both of them ill-tempered. On the other hand, Mr. Fulljames tells us (*The Avicultural Magazine*, March, 1898) that his Spix's Macaw "is one of the best-tempered birds in the collection." Canon Dutton evidently had not seen the example deposited at the Gardens in 1894. Russ only speaks of the bird as being extremely rare.

As all bird-keepers know well, it is impossible to be certain of the character of any species from a study of one or two examples only. Even in the case of birds which are generally ill-tempered and malicious, amiable individuals may occasionally be met with. Moreover, circumstances may alter cases, and a Parrot chained by the leg to a stand may be excused for being more morose than one in a roomy cage.

Blue and Yellow Macaw (*Ara ararauna*).

The prevailing colour of the upper parts is blue, the forehead, crown, and rump being somewhat greenish; the primaries and tail-feathers above of a purplish-indigo colour; the feathered lines on the cheeks are black; the chin of the same colour; the lower part of the face, throat, breast and belly saffron-yellow; the under tail-coverts greenish-blue; the tail and wings below yellow; the beak black; naked parts of the face white; iris of eye yellow; feet deep grey. Female slightly smaller, with shorter, narrower beak, the terminal hook shorter. Hab., Panama to Bolivia and Guiana, and throughout the Amazon Valley. Like the other Macaws, it inhabits wooded districts, laying its two eggs in a hole in the trunk of a tree; it is usually seen only in pairs, which may partly account for its limited importation to this country; for although, next to the Red and Blue Macaw, this is the best known species of its group, it is perhaps less frequently to be met with, excepting in zoological gardens. It is quite as noisy as the other species.

In his "Handbook" Dr. Russ gives no information of importance respecting this species. As is well known, it was bred as long ago as 1818 by Mr. Lamouroux; the hen nesting in a small barrel, pierced toward a third of its height with a hole of about 6 inches in diameter, and the bottom of which contained a bed of sawdust 3 inches thick, on which the eggs were laid and hatched.

"In four years and a half, from the month of March, 1818, to the end of August, 1822, these birds laid sixty-two eggs, in nineteen broods. Of this number twenty-five eggs produced young ones, of which ten only died; the others lived, and became perfectly accustomed to the climate. They laid eggs at all seasons; and the broods became more frequent and more productive in the course of time, and in the end much fewer were lost. The number of eggs in the nest used to vary, six having been together at one time; and these Macaws were seen to bring up four young ones at once. These eggs took from twenty to twenty-five days to be hatched, like those of our common hens. Their form was that of a pear, a little flattened, and their length equal to that of a pigeon's egg. It was only between the fifteenth and five-and-twentieth day that the young ones became covered with a very thick down, soft, and of whitish slate-grey. The feathers did not begin to make their appearance until towards the thirtieth day, and took two months to acquire their full growth. It was a dozen or fifteen months before the young arrived to the size of their parents, but their plumage had all its beauty from six months old. At three months old they abandoned the nest and could eat alone. Up to this period they had been fed by their father and mother, which disgorged the food from their bill in the same manner as pigeons do."

This species was first exhibited by the London Zoological Society in 1859, since which time specimens have been frequently added to the collection, sometimes several in one year; thus in 1871 no less than four were either presented or deposited, and in 1884 five were added, and in 1888 four, in 1889 three; altogether, I suppose something like five dozen examples must have found their way to the Regent's Park Gardens.

Red and Blue Macaw (*Ara macao*).

Prevailing colour, scarlet; the scapularies, greater and median wing-coverts above, yellow tipped with green; flights above, blue; lower back, rump, upper and under tail-coverts, pale blue; tail-feathers with black shafts, the two centre ones faintly tipped with blue, which increases externally, the three outermost feathers being almost entirely blue above; wings and tail below mostly orange-vermilion, the greater wing-coverts being, however, brownish, and the three outer tail-feathers very dark; feet blackish; beak with white upper mandible tipped with black, lower mandible black; naked skin of cheeks dull flesh-coloured; iris yellowish-white. Female smaller; the beak shorter and with shorter terminal hook. Hab., Mexico, through Central America to Bolivia, Guiana, and the Amazon Valley.

Speaking of this species, as observed by him in Costa Rica, Mr. A. Boucard says:—"Common at San Carlos. Every morning they fly about in large flocks. In the daytime you can see them in the forest eating fruit; they are easily detected by the noise they make, and by the rejected pieces of fruit constantly falling down from the trees on which they are perched."

While describing the cultivation of the tonca-bean tree, Eugène André says ("A Naturalist in the Guianas," p. 8):—"During the months of October and November, while the fruit is still quite small and green, the large Macaws and several other members of the Parrot family commit great havoc upon the young crop."

Dr. Russ speaks of this Macaw as common in zoological gardens, much admired on account of its splendid colouring, endures for many years; like the allied species, much attached to those of its kind, easily comes to grief through plucking itself. A bird belonging to Mr. Czarnikow, at the "Ornis" Exhibition of 1879, could speak about a hundred words.

Doubtless the plucking spoken of by Russ is due to improper food offered to these birds by visitors to the Gardens.

First deposited at the London Gardens in 1859; since which time a good many examples have been exhibited there, though far fewer than of the "Blue and Yellow" species.

Red and Yellow Macaw (*Ara chloroptera*).

Deep crimson; the lower back, rump, upper and under tail-coverts pale blue; lesser wing-coverts deep crimson; median coverts olive-green; greater coverts blue, but the innermost ones and the scapulars olive-green tinged with blue; flights blue; two middle tail-feathers deep red tipped with blue; the next two pairs blue, with broad red edges to both webs towards the base; remaining feathers almost wholly blue; flights and tail below golden red; naked skin on sides of head flesh-colour lined with red feathers; upper mandible horn-white, black at base of edges; lower mandible

black; feet greyish-black; irides straw-yellow. Female of the same size as the male, but with a shorter beak, broader when seen in profile, with more arched culmen. Hab., "Guatemala to Guiana and Bolivia and the Amazon Valley" (Salvadori.)

Burmeister ("Systematische Uebersicht," II., p. 156) says:—"This species goes farthest south of all the Araras, and formerly might even be met with in the wooded environs of Rio de Janeiro, now it has long since deserted the inhabited regions. It delights in the great primeval forests in the neighbourhood of rivers so long as they flow through level country, and is unwilling to ascend to the higher mountain-forests. Nevertheless, one finds it at the lower Parahyba and Rio da Pomba, as well as farther to the north in all the dense coastal woods right up to Bahia; yet it is in evidence even farther south than Rio de Janeiro, at St. Paulo."

"The loud, quite Crow-like, cry of the flushed bird astonished me, and I soon recognised it by its size and brilliant colouring. I cannot deny that the sound has a resemblance to the name of the bird Arara, but it sounded deeper, as a throaty sound which passed into a screech, and I do not doubt that in other ears it would seem exactly Arara. As a rule the indication of animal voices is subject to considerable variations, because different nations recognise different sounds from ourselves; whereby the difference of the accounts is explained. Thus, for instance, the Prince zu Wied denies the resemblance of the note to the name. According to the detailed information given by this attentive traveller the bird chiefly subsists on the fruits of the Sapucaya (*Lecythis ollaria*), the Juvia (*Bertholletia excelsa*), and various mealy palm-berries, such as the Licuri (*Cocos capitata*) or Aricuri (*Cocos carinata*), the reddish-yellow fruit-clusters of which are serviceable even for human beings, and must suit these birds admirably. One also sees them frequently busied with the fruits of the climbing plants, among which especially the forms called Spinhia by the Brazilians afford them food. All these plants thrive only in the dense primitive forest, and that is also the home of the bird; they do not occur on the open Campos, and they scarcely encroach upon the more open forests of the interior far from the larger rivers; but where the primeval forest is ever most in evidence the Arara can be expected with certainty. Yet one sees it only in small companies, and more often than with other Parrots, even solitary; they do not occur in large flocks, like several smaller species."

The first specimen of this Macaw exhibited at Regent's Park was deposited in 1861; altogether, probably about four dozen examples have, at various times, found a home there. It is a very well-known bird, which Russ speaks of as represented at almost every large exhibition.

Military Macaw (*Ara militaris*).

The prevailing tint is a somewhat olivaceous green, with the head of a purer green; on the nape is a slight bluish shade; the forehead and lines on the lores are vermilion; on the cheeks are greenish-black lines; the chin is brown; the hinder part of the back, the rump, and upper tail-coverts are pale-blue; the primaries and secondaries blue, yellowish olivaceous below; the under wing-coverts green, the greater ones slightly dusky; the four central tail-feathers dull red, broadly tipped with blue; the two next on each side blue, edged towards the base with dull red; the two outer feathers almost wholly blue; under-surface of tail olivaceous yellow; the naked skin of the cheeks flesh-coloured; iris of eye yellowish-grey; the beak blackish, and the legs blackish-grey. Female smaller, with distinctly shorter beak, the culmen more arched. Hab., Mexico to Central and South America, occurring from Bogota to Peru and Bolivia.

Stolzmann ("Taczanowski's Ornothologie de Pérou," Vol. III., p. 192) says: "It keeps in companies composed of two, three, or more pairs. The most numerous which I have seen was of nine pairs; they usually fly very high, making themselves heard by a penetrating and strong voice. After they have settled upon a tree they feed in silence, and one is only conscious of the crushing of fruit and the sound of the fall of the remains of the husk. Sometimes they only babble quietly, as if they were holding a conversation together. It is a very cautious bird; at the slightest cracking of a branch their leader, crying *cra-cra-cra*, alarms the whole assembly, which departs crying. Their flight is hurried.

"At Concolo, a colony composed of some cottages above the little town of Choros, I have seen the nesting-place of the Parrakeets. It was a vertical, clayey declivity excavated in many burrows; these holes serve for its eggs. A very numerous colony has successively occupied it without intermission. It was in the month of May. I suppose, however, that it may also nest in holes in trees."

In his "Two Bird-lovers in Mexico" C. W. Beebe says (pp. 173, 174): "In the morning we were wakened by the screams of Macaws. When the notes first reached my ear I knew that I had heard them before, but where I could not think, and not until I rushed out and saw the birds did I connect the sound with the din of a Parrot-house in a zoological park. There the harsh screams rend one's ears, but here, between the walls of the mighty gorge, it is an entirely different utterance. From high overhead the guttural tones came softened, and, our eyes following, we see a pair—always a pair—of the great birds, with their long, sweeping tails and quickly-vibrating wings, passing steadily across the sky. While thus silhouetted against the light they seemed black, but when they reached a background of rock or trees their colours flashed out—beautiful living greens with lesser tints of brown and golden olive. They were Military Macaws, and they always flew thus closely together, morning and evening, from roost to feeding-ground and back."

As usual, this species generally nests in hollow trees, laying its two eggs on the bare wood. Though rather smaller than its handsome relative, the Red and Blue Macaw, this species has quite as powerful a screech. In its own country it is said to be very destructive to the crops.

Attempts have been made to breed this species, and (I believe) with partial success, inasmuch as young have been hatched; but whether any have ever left the nest I cannot say. Doubtless in a very strongly-built and extensive aviary, furnished with plenty of branches and hollow logs, this or any other Macaw might be successfully bred, and as these birds are still very expensive it might be worth while for a man who had a big aviary vacant to try the experiment; only I should advise him to have a very stout wire for its enclosure, or the Macaws, with their natural cutting-pliers, would soon be at liberty. When tame the Military Macaw is intelligent, and soon learns to speak or imitate the cries of animals.

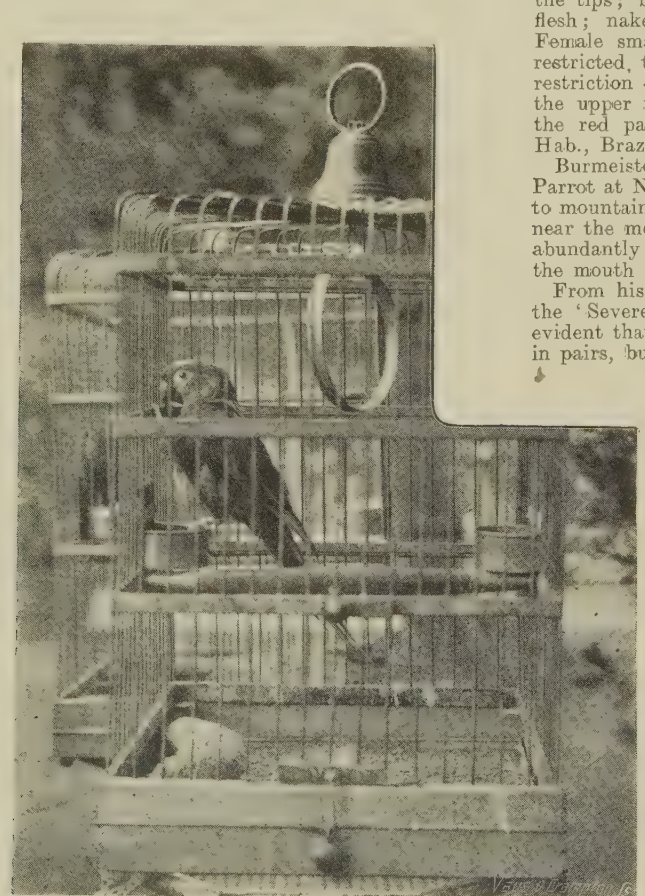
The first example exhibited at the London Zoological Gardens in Regent's Park was purchased in 1864, and others have been purchased, presented, or deposited

since that time, but it has not been secured in anything like such numbers as the last three species. Russ says of it: "Fairly frequent in zoological gardens; rare with aviculturists."

Severe Macaw (*Ara severa*).

Green; primary coverts and flights blue, the latter edged with black at the tips, the secondaries with green edges to the outer webs; innermost secondaries entirely green; tail-feathers above reddish-brown, edged with green towards base and tipped with blue; head washed with blue; forehead, margin of cheeks, and chin chestnut-brown; feathered lines on cheeks black; naked skin on sides of head whitish flesh-colour; edge of wing and outer lesser wing-coverts below red, the rest green; greater under-coverts dull-olive; flights and tail below deep golden-red; beak and feet black; irides yellow. Female probably with shorter beak and more arched culmen. Hab., "Brazil, the Amazon's Valley to Bolivia, Guiana, Colombia, and Panama." (Salvadori.)

According to Burmeister ("Systematische Uebersicht," Vol. II., p. 161):—Prince zu Wied says that "it lives in pairs during the breeding season, otherwise in company, subsists especially on the fruit of the Jandiróba (*Feuillea cordifolia*) of the Jikitibá, and another with milky juice, which the prince did not recognise. Their flocks are very injurious to the maize plants. When seeking food in the tops of the trees, they are, like many species, talkative; utter all kinds of wonderful sounds, such as snarling, shouting, whispering, and they fly thence with screeching cries as soon as one approaches them. Their flight is strikingly rapid." The London Zoological Society acquired two specimens of this bird in 1884, one by purchase, the other on deposit. Russ says that it occurs "in Zoological Gardens and at all exhibitions, rarely in the hands of an aviculturist; little admired. Price 15 to 20 marks for a specimen." From the above it would appear that it is only exhibited by dealers.



Illiger's Macaw.
(*Photograph from life.*)

Illiger's Macaw (*Ara maracana*).

The prevailing colour of this bird is green; the rump, upper tail-coverts, and under wing-coverts olivaceous; forehead, rose-red; remainder of head and nape, greenish blue, the crown deeper in tint; a red patch on the lower back and another on the middle of the abdomen; front margin of wing bluish; wing, excepting the lesser and median coverts, chiefly blue; tail blue, the base washed with reddish-brown; under surface of flights and tail yellowish olive, dusky towards the tips; beak horn-black; feet brownish or ochreous flesh; naked cheeks yellowish flesh*; iris, chestnut. Female smaller, the rose-red on the forehead more restricted, the beak slightly shorter. In the young the restriction of the rose red on the forehead is greater, the upper parts are spotted with greyish-brown, and the red patches on back and abdomen are yellower. Hab., Brazil and Paraguay.

Burmeister says of this Macaw: "I obtained this Parrot at New Freiburg, but only once; it is no friend to mountain forests, but lives rather in the lower plains near the mouths of streams; it is, for instance, found abundantly on the Parahyba between Cape Frio and the mouth of the river."

From his further observation—"that it agrees with the 'Severe Macaw' in its manner of life"—it is evident that during the breeding season it is seen only in pairs, but at other times in companies, that it subsists upon fruits of various kinds and maize, that when feeding in the tree-tops it is extremely noisy, and its flight is astoundingly rapid.

An interesting account of this species in captivity is given by Mr. O. E. Cresswell in Vol. IV. of *The Avicultural Magazine*, First Series, pp. 65-67.

Illiger's Macaw first arrived at the Regent's Park Gardens in 1861, after which there was an interval of ten years, and then two examples were added; others have been purchased or deposited since that time.

Russ says: "A pair belonging to Dr. Frenzel bred one young one, which, however, only survived a few days. The pair were very amorous; little destructive to woodwork; rarely screamed; on the contrary, they uttered not unpleasant sounding grunts, and the male also a little song; never fly in the aviary, climb actively. They first went to nest in June, 1880. Clutch two eggs; the female

* Burmeister says the cheeks are reddish-yellow; the iris, brown internally, orange externally.

incubated alone, fed by the male. Peaceful during incubation, almost noiseless; the male then spiteful, even bit Eclectus Parrots and others. Second brood May, 1881; duration of incubation 24 days." After the last brood the old birds became such furious screamers and so malicious to other birds that Dr. Frenzel gave them away."

Noble Macaw (*Ara nobilis*).

Green, rather yellower below than above; first primary-coverts and first primary bluish on outer web; edge of wing from bend scarlet; forehead and a band over the eyes blue; naked skin of the cheeks white; greater under wing-coverts golden olive; remaining coverts scarlet; flights and tail-feathers below golden olive, the former dusky on outer webs; upper mandible horn whitish with black tip; lower mandible horny brownish-black; feet brownish black; irides yellow. Female slightly smaller, with shorter beak, more compressed towards the terminal hook. Hab., "Brazil from Para to Matogrosso and the Eastern Provinces." (Salvadori.)

Burmeister says ("Systematische Uebersicht," Vol. II., p. 163): "The species inhabits the central Brazils, but not in abundance." "Its manner of life is the same as the preceding."

This Macaw has been represented in our Zoological Gardens, but Russ says it is rare in the trade. "Mrs. von Proschek, of Vienna, had a pair for years; it even made attempts at breeding, but brought up no young; The female was tame and lovable, the male clever as a speaker; had learnt 50 words as well as singing and laughing. Price high, although little esteemed."

Hahn's Macaw (*Ara hahnii*).

Differing from the preceding species in its inferior size and entirely horn black beak. Female with broader skull and beak; the latter shorter and narrowing more just before the terminal hook. Hab., "Guiana, Trinidad, and Rio Branco." (Salvadori.)

I have discovered no notes respecting the wild life; but doubtless it closely corresponds with that of the preceding species.

The London Zoological Society purchased a pair of this Macaw in 1872.

Conures.

The Conures are numerous, and many of them have been imported, but as a general rule they do not commend themselves to aviculturists, though the late Mr. Cresswell, who had kept three species, was favourably disposed towards them. They are very hardy, long-lived, and some of them are good talkers; but I think even their most eloquent advocate cannot deny that they are noisy. There is no question that they are extremely destructive to woodwork, and they are reputed to be malicious towards other birds, so that it is necessary to keep them by themselves; nevertheless, they are intelligent, become remarkably tame, confiding, and even affectionate towards their owners; some of them also have bred in captivity.

In their wild state Conures feed upon seed, fruit, and green food; in captivity Mr. Seth-Smith recommends: "Canary, hemp and millet seed, and oats," "while green food, such as chickweed, flowering grass, groundsel, and fruit, should be added, freely in the summer and sparingly in winter. Sunflower seed is also appreciated by some species." ("Parrakeets," p. 27.)

Sharp-tailed Conure (*Conurus acuticaudatus*).

Green; flights olive on the inner webs; lateral tail-feathers brownish-red at base of inner webs; crown, lores, cheeks, and ear-coverts dull blue; naked orbital skin white; breast sometimes bluish; greater under wing-coverts dull olive; flights below golden olive, dusky towards tips and on outer webs; tail below olive, the base of inner webs golden red; upper mandible whitish with blackish tip; under mandible blackish; feet yellowish flesh-colour; irides red. Female with narrower beak and longer terminal hook than in the male. Hab., "Bolivia, Paraguay, Northern Argentina, and Uruguay." (Salvadori.)

Hudson says ("Argentine Ornithology," Vol. II., p. 42):—"White obtained specimens of this Parrot near Andalgala, in Catamarca, in September, 1880. He tells us that it is not very abundant in that district, and flies very swiftly in flocks of seven or eight, screeching continually when on the wing."

Mr. J. Graham Kerr (*The Ibis*, 1892, p. 140) says that it is abundant on the Lower Pilcomayo in spring and summer.

The species is rarely imported, but a specimen was exhibited at the London Zoological Gardens as long ago as July, 1868.

Blue-crowned Conure (*Conurus hæmorrhous*).

Differs from the preceding species in its brighter green colouring, with only the forehead and crown bluish; the naked orbital skin whitish flesh-colour, as also both mandibles; the feet dirty flesh-colour; irides either yellowish-brown, yellow, or orange. Female probably differs from the male as in *C. acuticaudatus*. Hab., "Brazil, from Bahia to Cujaba in the interior." (Salvadori.)

Burmeister says ("Systematische Uebersicht," Vol. II., p. 165): "This species inhabits the Campos region in the interior of Brazil, and extends from the Amazon to the River Paraguay."*

I have found no notes on the wild life.

Mr. Seth-Smith ("Parrakeets," pp. 29, 30) quotes a passage from Russ respecting examples in the possession of Mr. Schmalz, of Vienna; this gentleman's birds were said to be gifted with great intelligence; they became wonderfully tame, and one of them said several words as distinctly as a Grey Parrot.

Though rarely imported, this bird was first exhibited at the London Gardens in 1864, and altogether something like a dozen examples have from time to time found a home there.

Golden Conure (*Conurus guarouba*).

The prevailing hue is deep lemon-yellow; the flights dark green above, golden-olive below; beak horn yellowish; feet flesh-coloured; naked skin round the eye whitish; iris varying from deep orange to brown. Female paler in colouring, not so bright; the beak shorter and more curved. Young birds have the cheeks and upper wing-coverts flecked with green, and when still younger are nearly all green. Hab., North-eastern Brazil.

According to Burmeister this species is a native of both sides of the Amazon and down to Pernambuco and Bahia, but is nowhere abundant. Wallace found it "very rare in the neighbourhood of Para, where it appears once a year, when a particular fruit is ripe." He only saw one flock in one tree, and shot four or five specimens.

An example of this Parrot was purchased by the Zoo-

* He confounds it with *C. acuticaudatus*.

logical Society of London in 1871, and a second one was acquired by exchange in 1880; the Hon. and Rev. F. G. Dutton (*The Avicultural Magazine*, Vol. IV., p. 173) speaks of a third which he saw there on deposit, and which he says is "the only really fascinating Conure I have seen. You could swing it about by one leg or by the tail; it would lie on its back in your hand, and delighted in being played with; it was said to be a good talker."* On the other hand, Prince Ferdinand of Saxe-Coburg-Gotha considered the bird apathetic and wearisome; he said that it gnawed through a lot of wood, but had no objectionable cry. It is perfectly evident that with this, as with most birds, individuals differ greatly.

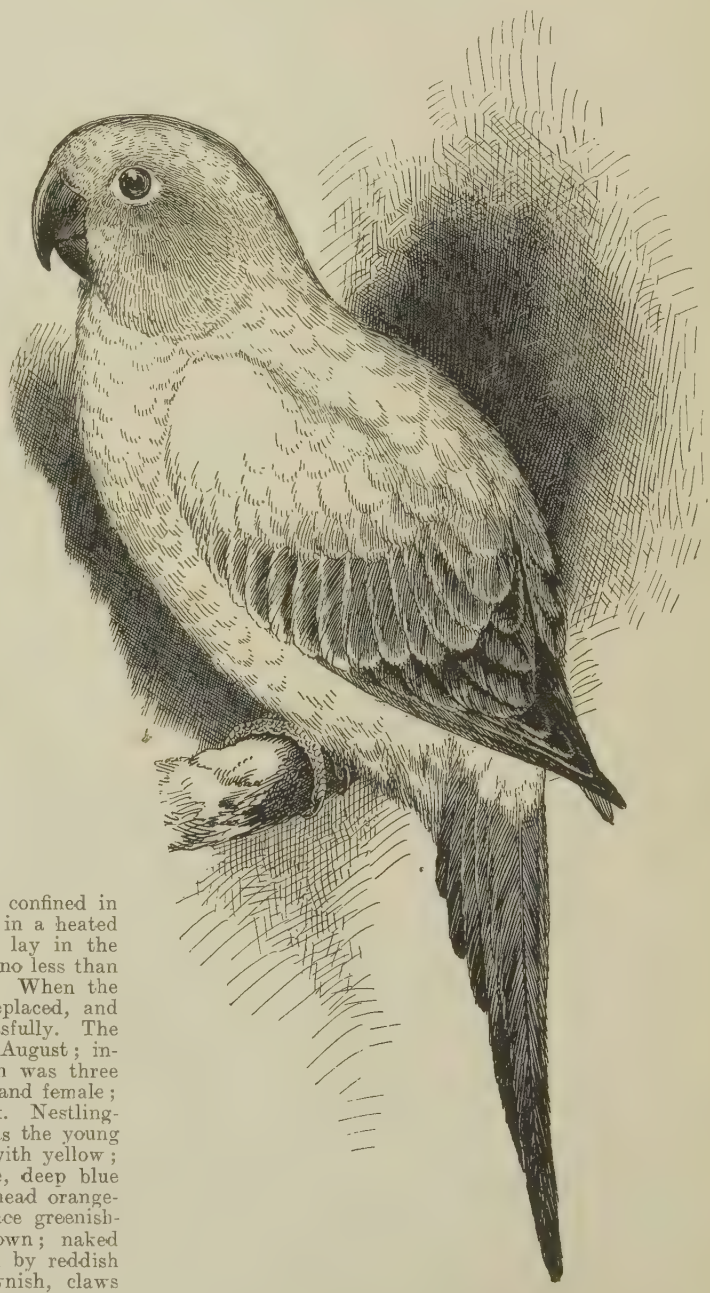
YELLOW CONURE (*Conurus solstitialis*).

Yellow; tinged with orange on the lower back, rump, forehead, sides of head, lower breast and abdomen; sometimes all over the yellow feathers; greater upper wing-coverts green, irregularly tipped with yellow; bastard-wing, primary-coverts, and secondaries dark blue margined with green externally; primaries with the outer web green towards base, blue towards tips; tail olive-green towards base, blue towards tips, the outer feathers on each side with the outer web entirely blue; under wing-coverts wholly yellow; flights and tail-feathers below olive, dusky towards tips; beak brownish horn-grey; feet flesh-brown, claws black; irides dark brown. Female with shorter and slightly narrower beak, not quite so deep when viewed in profile. Hab., Guiana and Rio Brancho.

Much valued by the natives in its own country, and on that account tamed, so that in some villages from twenty to thirty may be seen flying about at liberty.

Russ mentions, on the authority of Mr. H. Gadeau de Cerville, of Rouen, that a pair was in the possession of his wife from 1872, which in summer was confined in an open-air aviary, from October to April in a heated room. The female for four years did not lay in the aviary, but in the following four years laid no less than twenty-nine eggs, four to six to a clutch. When the male died in 1881, it was immediately replaced, and this pair after two years nested successfully. The female laid four eggs in July and three in August; incubated alone; the duration of incubation was three weeks. The young were fed by both male and female; they remained three months in the nest-box. Nestling-down short, whitish-grey. At four months the young plumage was green above, slightly mixed with yellow; wing and tail feathers pale yellow at base, deep blue at tips; crown, back of head and sides of head orange-yellow, more or less greenish; under surface greenish-yellow, abdomen pale red; eyes dark brown; naked orbital ring pale flesh-coloured, surrounded by reddish feathers; beak brownish-black; feet brownish, claws black. He furthermore says that this Conure is easy to tame, and gifted as a talker. Canon Dutton, however, says that "Russ makes no remark upon their qualities as pets."

The Zoological Society of London first acquired this bird in 1862, since which date other examples have been purchased by or presented to that body.



YELLOW CONURE.

* He also mentions two young examples which he saw in Mr. Bartlett's possession.

YELLOW-HEADED CONURE (*Conurus jendaya*).

This is a very showy Parrot, its head being bright yellow, suffused with orange-red on the forehead, round the naked eye-ring, on the throat, breast, belly, and the margins of the feathers of the lower back and rump; the bastard-wing, primary-coverts, outer webs of primaries, excepting towards the base, outer tail-feather and tips of all the others above, blue; inner webs and under surface of quills, greater under wing-coverts, and under surface of tail, blackish; remainder of plumage green; beak black; feet blackish, with black claws; iris varying from pearl-grey to brown. Female probably with shorter and narrower beak than the male. Hab., Eastern Brazil.

This bird is said to visit the maize crops in small flocks consisting of from eight to twenty individuals, and to do much mischief; its cry is loud and startling, and it is very destructive to wood; nevertheless it has a very good character as a cage and aviary bird, being peaceable, affectionate, and harmless when associated with smaller birds.

Dr. Russ says: "A pair belonging to me took possession of a nest-box; the male and female were very tender to each other, carried out the whole business naturally, even sat together on the laying of four eggs. If anyone approached the cage they sought to scare the invader with bristling feathers and puffed out neck ruffles, with stooping and other wonderful gestures. Looking subsequently I found seven hatched dried-up young. They have laid eggs with several other breeders, but hitherto have not been successfully reared."

However, Mr. Seth-Smith ("Parrakeets," p. 34) quotes an account of the successful breeding of the species recorded in "Notes on Cage Birds," Second Series, p. 173, by a writer who signs himself "Blue Robin." Oddly enough, as in the case of the Yellow Conures described above, the young appear to have remained in the nest (from the commencement of the incubation of the eggs) about three months. It seems a long time, but with two independent witnesses there can be no question of its correctness. Four specimens of this pretty Conure reached the London Gardens in 1869, and altogether a fair number have been since acquired.

GOLDEN-HEADED CONURE (*Conurus auricapillus*).

Differs from the preceding, but with the front of the crown yellow; the back of crown and hind neck green; the sides of head green, more or less washed with yellow; a reddish tinge round the naked orbital region and on the ear-coverts; throat and front of breast green, back of breast and abdomen red, with the base of the feathers more or less green. Female with shorter and narrower beak, less deep when viewed in profile. Hab., Eastern Brazil.

I have found no notes respecting the wild life of this species. It is very rarely imported, and is not mentioned in Russ' "Handbook"; it has, however, been exhibited at our London Zoological Gardens more than once.

BLACK-HEADED CONURE (*Conurus nenday*).

Dr. Russ thus describes it: "An extraordinarily coloured Parrot; grass-green, on the underside yellowish-green; forehead, crown and front of cheeks deep brownish-black; back of head, dark chestnut-brown; ear-coverts, lower back and rump yellowish-green; flights and tail-feathers marked with blue; throat and upper breast greyish blue-green; thighs scarlet-red; beak blackish horn-grey; eyes red to black-brown; feet brownish horn-grey; claws blackish." Female with a narrower beak, not so deep when seen in profile. Hab., Paraguay and Argentina.

Mr. J. Graham Kerr (*The Ibis*, 1892, p. 140) says: "Abundant, in very large flocks, about the neighbourhood of Fortin Page. Frequently associates with flocks of *Bolborhynchus monachus*. One of the favourite foods of these species consists of the berries of the parasitic *Loranthaceæ*, which are so common on some of the trees."

In a subsequent paper, on the Birds observed in the Gran Chaco, the same author (*The Ibis*, 1901, p. 229) says: "Very common in large flocks." It is therefore not surprising that, although regarded as a great rarity when first purchased by the London Zoological Society in May, 1870, it is now a very freely imported species. Russ says of it: "Since 1870 occasionally imported singly; in 1878, for the first time, in several pairs by Charles Jamrach, of London; after that it made its appearance from time to time in bird-rooms. Behaviour comical; cry penetrating, loud, hardly so shrill as that of the Carolina Parrot; sexes very affectionate. Bred in 1881 by Baron von Cornely. Unhappily no further details communicated. Price 20 to 30 marks for the pair."

Mr. Seth-Smith ("Parrakeets," pp. 36 and 37) quotes two accounts of the breeding of this species in England, one from "Notes on Cage Birds," the other from *The Avicultural Magazine*." Yet he tells us that "It is not a popular species with aviculturists." In the trade this Conure is generally known as the Nenday or Nanday Parrakeet.

RED-HEADED CONURE (*Conurus rubrolarvatus*).

Bright green, slightly paler on underparts; the whole front of the head to well behind the eyes and including the chin, also the bend and front edge of the wing, lesser and median under wing-coverts and thighs, scarlet; greater under wing-coverts, flights and tail below olive, the former dusky at tips and on outer webs; beak yellowish-white; naked orbital ring pale yellow; irides yellow. Female probably with a narrower beak than the male. Hab., Colombia, Ecuador, and Peru.

Stolzmann says (Taczanowski's "Ornithologie du Pérou," Vol. III., p. 198): "Very common on the coast, whence it disappears in March and April."

In *The Avicultural Magazine*, First Series, Vol. VI., p. 69, Mr. Walter Goodfellow says: "These birds I saw offered for sale in Guayaquil at 5d. each, and no doubt at half that price they could have been bought. Being rather large birds, they show off their colour to advantage. I imagine, though, they must be rather noisy birds to keep, for they have a disagreeable shriek. They ought not to be at all delicate, for we shot specimens near the Volcano of Paracé, by Popayan, in Colombia, at an altitude of over 8,000 ft. In passing through the little village of Carmen (still in Colombia*), on our ride from Buenaventura to Cali, we saw the same birds in immense clouds, coming from their feeding grounds in the high mountain forests, to pass the night in the little sheltered valley below. Carmen could boast of little else in the way of vegetation but bamboos, which grew in great thickets, and every branch of these giant grasses was literally weighing down with its burden of *C. rubrolarvatus*. The noise was simply deafening! Those we shot by the acid waterfall of Paracé, in the month of May, 1898, were undoubtedly nesting in the crevices of the perpendicular cliffs there; for on the report of our firearms numbers of them flew screaming from the holes and ledges around. I noticed,

* Probably by a printer's error it is spelt Columbia in the article.

too, that the plumage of some was draggled, evidently by sitting on their eggs."

First purchased by the Zoological Society of London in 1854, since which time one or two others have been added to the Regent's Park collection. Russ speaks of an example in the possession of Mr. C. Pallisch, of Vienna, which was "delightfully tame, spoke several words, laughed, and coughed." It is, however, a rarely imported species.

Wagler's Conure (*Conurus wagleri*).

Green, slightly paler on underparts; forehead and crown red; some red feathers, sometimes forming a band across the throat; greater under wing-coverts, flights, and tail below olive; beak yellowish-white; feet dusky; irides yellow. Female probably, as usual, with a narrower beak. Hab., Venezuela and Colombia.

The wild life appears to be undescribed, and Russ gives no notes in his "Handbook" respecting its life in captivity. One example was purchased by the London Zoological Society in July, 1873, but it seems to be very rarely imported.

Green Conure (*Conurus leucophthalmus*).

Green, rather paler on underparts; bend of wing, front edge of same, and lesser under wing-coverts red; greater under-coverts yellow; flights and under tail-coverts golden-olive, the former dusky towards tips and on outer webs; beak yellowish flesh colour; naked orbital ring ashy flesh colour; feet dusky; irides greyish or reddish orange-yellow. Female beak broader at the base and with coarser terminal hook than in the male. Hab., Guiana, Trinidad, Colombia, and through the Amazon Valley to Eastern Peru, Bolivia, and Brazil. (Salvadori.) Also found in Uruguay. (Aplin.)

Mr. O. V. Aplin (*The Ibis*, 1894, pp. 191, 192) says:—"I found this fine Parrot only in the valley of the Rio Negro, where, without being scarce, it is not abundant. It is known there as the 'Loro,' or the 'Barranquéro,' the latter name properly belonging to *C. patagonus*, which is unknown there. The 'Barranquéro' (to retain the most usual local name) to a great extent keeps to particular spots in the monte, although it visits the chacras when the maize is ripe. They are rather shy and not very easy to procure, as when sitting on the trees their green colour renders them inconspicuous, and they easily take alarm and fly off to a distance. They are usually seen in pairs, or in parties of four or five, flying over the trees or the river at a great pace, uttering rather deep-toned harsh screams. The two specimens I procured had been feeding on some unripe flat-shaped seeds. They were in worn plumage (December). The charcoal-burners there say the 'Loros' breed in holes in trees, and as they occasionally procure young birds for English and other residents they are doubtless correct. At the end of March I saw two young ones which had been brought from that locality, and from what I could learn, were taken about the end of February. They must grow their feathers very slowly, as one was not nearly covered at the time I saw them. The talking powers of this bird are very considerable, and it is highly prized in captivity on this account. They become wonderfully tame."

Two examples were presented to the London Zoological Society in 1871, and several others have since been exhibited at the Gardens, but it is rarely imported. Russ observes that it is reported by travellers to be tameable and teachable.

Mexican Conure (*Conurus holochlorus*).

Green, underparts paler; greater under wing-coverts, flights and tail below olive; sometimes a few scattered red feathers on throat and breast; the flights dusky towards the tips and on outer webs: beak yellowish flesh colour; naked orbital skin and feet brownish flesh colour; irides brown. Female with stouter beak than the male. Hab., Mexico to Nicaragua.

Salvin says of this species ("Proceedings of the Zoological Society," 1860, p. 44):—"It frequents the patches of maize (*Zea mais*) which cover the hill-sides, and commits serious damage on the crops. It may constantly be seen flying over the plains and low country at all hours of the day, in flocks varying from two birds to twenty or thirty in number. When any large number fly together they usually—I may say almost always—divide themselves into couples, though these do not preserve regular order like a flock of geese."

A rarely imported species, which has nevertheless been exhibited at the London Zoological Gardens. In his handbook Russ describes it, but gives no information respecting it.

Red-collared Conure (*Conurus rubritorquis*).

Differs from the preceding species in having the chin and throat occupied by a broad red band (according to the illustration from life the beak is buffish horn colour; the naked orbital ring pale lilacine; the feet sordid flesh colour; the irides hazel). Hab., Nicaragua. In the "Museum Catalogue of Parrots" Count Salvadori regarded this as a variety of the Mexican Conure; but the receipt of ten specimens from Nicaragua by Messrs. Salvin and Godman convinced him that the two were distinct species. (*Cf.*, *The Ibis*, 1907, p. 321.)

The typical specimen reached the London Zoological Gardens in April, 1886. It was purchased from Cross, of Liverpool. It is figured in the "Proceedings of the Society" for that year, on plate LVI., and I have taken the colouring of the soft parts from that figure.

Aztec Conure (*Conurus aztec.*)

Upper surface green; a narrow orange-yellow frontal band between the nostrils; flights blue tipped with black, green at base of outer webs; tail tipped with blue; throat and front of breast brownish-olive, with darker shafts to the feathers; back of breast and abdomen olive; flanks, thighs, and under tail-coverts green; tail below golden-olive; smaller under wing-coverts and axillaries pale yellowish-green; beak brownish horn colour; feet blackish; irides yellow. Female with the beak rather broader at base, and with a coarser terminal hook. Hab., "Southern Mexico, Guatemala, Honduras, Nicaragua, and Costa Rica." (Salvadori.)

In a paper on "Birds from Yucatan" ("Proceedings of the Zoological Society," 1883, p. 455) Mr. A. Boucard says:—"This bird abounds in all parts of Yucatan; but the largest flocks were met with in Western Yucatan, where 400 or 800 were seen in a single flock. In November and December they were feeding upon the seeds of a plant which grows very abundantly in that part of this State. The sharp, piercing cry of these birds is almost deafening when in large flocks."

This species was purchased for the Zoological Gardens of London in 1868, two specimens being secured in May of that year. Two more were purchased in 1874, and another in 1876, so that it is evident that a few are imported from time to time by the English dealers.

Cactus Conure (*Conurus cactorum*).

Count Salvadori thus describes this species:—"*Adult male*. Upper parts green, pileum pale brown, lighter on the edges of the feathers and blending on the nape in the green colour of the back; lores, cheeks, throat, sides of the neck, and upper breast pale brown; a yellow line below the eyes, edging the upper ear-coverts; ear-coverts green; lower breast and abdomen dull orange; flanks, thighs, and under tail-coverts yellowish green; bastard wing and primary coverts green, with a slight bluish tinge, especially on the inner webs; primaries bluish-green, greener towards the bases of the outer webs; secondaries greenish blue; all the quills tipped with blackish; carpal edge yellowish in the middle; smaller under wing-coverts yellow-green, the greater ones and quills below blackish grey; tail above green, with the four central feathers blue towards the tips, below golden-olive, with the outer webs dusky; upper mandible whitish, under mandible horn-brown; feet, pale horn-brown; iris orange." Russ says, "Beak clear whitish horn-grey, the cere white; eyes yellowish grey to orange-yellow, with naked whitish grey ring; feet, deep flesh-coloured." Burmeister says the "beak is dull whitish horn-grey, darker towards the base, the iris narrowly bordered with orange, the naked orbital ring grey; the legs flesh-red suffused with deep grey."

The female is decidedly smaller, and has a shorter beak. Hab., South-Eastern Brazil.

In its wild state this Parrot is met with in open pastures feeding upon the fruits of *Cactus*, whence it has derived its name; when flying from one place to another its piercing cry is heard continually, but when feeding it is perfectly mute.

This is a freely imported species; and, in spite of its terrible voice, is a general favourite with Parrot-lovers: both the late Mr. O. E. Cresswell and Miss Alderson have written pleasantly about their examples of this bird in the pages of *The Avicultural Magazine*. Of his pair Mr. Cresswell wrote:—"They don't talk, but are always merry and bright, and seem to have a great capacity for enjoying life." I believe that Russ' statement that "hitherto they have not been bred" still holds good of the Cactus Conure, unless perhaps the fact has been unrecorded. If the London price for the species is anything like so reasonable as that mentioned by Russ, "eight to twelve shillings a pair," it may have been bred half a dozen times by amateurs, who might have had no interest in publishing the fact.

The London Zoological Society purchased its first specimen of this bird in 1862, and has added remarkably few examples since that date.

Brown-throated Conure (*Conurus æruginosus*).

Above green with a slight blue tinge on the crown; bastard wing and primary-coverts bluish towards tips; flights blue, green towards base of outer webs; tail above green, bluish at tips of central feathers; forehead, front of lores, cheeks, ear-coverts, and throat buffish-drab; naked orbital skin (broad below the eye) orange-yellow; breast, abdomen, smaller under wing-coverts and under tail-coverts yellowish-green; an orange patch at middle of abdomen; greater under wing-coverts and flights below blackish; tail below golden-olive; beak horn-brown; feet brown; irides probably orange. Female differs in having a longer and more slender beak than the male, thus reversing the usual rule. Hab., Guiana, Venezuela, and Rio Negro.

In its wild life this Conure appears to agree very closely with the preceding species. Mr. P. R. Lowe, writing on the "Birds of Margarita Island, Venezuela" (*The Ibis*, 1907, p. 557), says: "This is a common bird in Margarita. It frequents the low-lying coast-belt, as well as the hills. Large flocks used to fly over regularly in the evening from the tall mangrove-trees lining the large lagoon at the west end of the island, making their way towards the foot-hills, where apparently they roosted."

A frequently imported species, but I should imagine hardly a favourite to judge by the number presented to or deposited at the London Zoological Gardens since 1866; it would have been a work of supererogation for the Society to purchase the species.

St. Thomas' Conure (*Conurus pertinax*).

Back of head, nape, and rest of upper surface green; bastard-wing and primary-coverts bluish towards the tips; flights blue, edged with black at tip, the outer webs green towards base; four central tail-feathers bluish towards the tip; forehead, sides of head and chin yellowish-orange; crown slightly bluish; throat and front of breast olive; back of breast and abdomen yellowish-green, the middle of the latter orange; smaller under wing-coverts yellowish-green, greater coverts blackish, slightly edged with yellowish; flights below blackish; tail below golden-olive; beak horn-brown; feet dusky. Female apparently with the beak broader and shorter. Hab., St. Thomas, St. Croix, and Curaçao.

According to Dr. Hartert (*The Ibis*, 1893, p. 320) these birds "are no longer caught for sale, while formerly they were brought to the steamers by the negroes. On Curaçao it is very numerous in the western parts of the island, but not so common, although by no means rare, in the eastern. The nests are mostly built in large ants' nests placed in trees, into which they dig holes. The negroes take the young ones from the nests and keep them in cages. Large numbers are sold to the sailors."

Although, in his "Handbook," Dr. Russ only mentions the name of this species, not even describing it, the Zoological Society of London purchased two specimens in 1865, and has exhibited a fair number in the Regent's Park Gardens since that date. The late Mr. O. E. Cresswell described a specimen in his possession in *The Avicultural Magazine*, First Series, Vol. IV., p. 176, and it is safe to conclude that other aviculturists have, from time to time, owned specimens.

Golden-crowned Conure (*Conurus aureus*).

The prevailing colour is grass-green, the forehead and crown, as well as a circle round the eye, orange-yellow or red, vertex and lores dull blue, back of head and ear-coverts washed with bluish; flights black with a blue spot at the tips, below olivaceous dusky at the tips; the tail-feathers blackish-grey below; cheeks and throat olive, slightly washed with bluish, remainder of under surface orange-yellow in the centre, greenish at the sides; beak black; feet blackish-brown; iris varying from grey to orange-yellow, or even to chestnut. Female with shorter and broader beak. Hab., Guiana, the Valley of the Amazons, Bolivia, Brazil, and Paraguay.

I have not discovered any account of the wild life of this species (though Russ says it is destructive to the rice-crops), but it has been bred in captivity, Mr. J. Wenzel, of Danzig, having bred it in 1880 in a large cage, where it was associated with Red-rumps and Cactus Conures. The sitting of two eggs was produced in April, and both parents incubated them; incubation lasting twenty-six days. The young left the nest after fifty days, and resembled their parents excepting that

their colouring was a little duller, the beak horn-grey, and the birds themselves slightly smaller. During the breeding the male was so spiteful to the other Parrots that they had to be removed. This is a hardy, long-lived species.

A strikingly coloured and freely imported bird, its price, according to Russ, being ten to twelve or even eight marks for a pair. The first examples owned by the London Zoological Society were presented in 1862; altogether nine specimens are enumerated in the fifth edition of the "List of Animals," and since that time many others have been added.

Petz's Conure (*Conurus canicularis*).

Green; primaries blue towards the tips and with black tips; the inner webs blackish; secondaries blue, the outer webs narrowly edged with green; tertiaries green; two central tail-feathers slightly bluish towards the tip; forehead orange-red; crown and lores blue; cheeks olive-green; throat and breast olive; abdomen, under wing- and tail-coverts greenish-yellow; greater under wing-coverts blackish-grey, with yellow edges; flights below blackish-grey; tail below olivaceous yellow; the outer webs of the feathers slightly dusky; upper mandible flesh-white; under mandible white in front, dusky on sides; feet grey (or blackish-brown); naked orbital skin white (yellow or brownish, according to Russ); irides yellow to yellowish-brown. Female with the beak more finely formed and less curved. Hab., Mexico and Central America to Costa Rica.

Mr. C. W. Beebe ("Two Bird Lovers in Mexico," pp. 178 and 181) says: "These little fellows have an individuality which is irresistible. They are the most sociable little creatures, calling loudly to each other when on the wing, and keeping up a continuous low chuckling and chattering when perched. One would climb, foot over foot, to a large fruit, take several bites, and return to his mate, close to whom he would snuggle and offer his head for an affectionate nibble. The favourite fruit of these birds was very sticky and juicy, and the little creatures were almost always in a disgracefully soiled condition—their bills and heads encrusted with the gummy liquid. These little Parrakeets were not shy, but very watchful, and, when frightened, they always flew to a curious tree which, though bare of leaves, was sparsely covered with an odd-looking, long, and four-sided fruit of a green colour. Under such circumstances, they alighted all together, and, unlike their usual custom of perching in pairs, they scattered all over the tree, stood very upright, and remained motionless. From a distance of fifty feet it was impossible to distinguish Parrakeet from fruit, so close was the resemblance. A Hawk dashed down once and carried away a bird, but the others remained as still as if they were inanimate fruit. This silent trust in the protective resemblance of the green fruit was most remarkable, when we remembered the frantic shrieks which these birds always set up at the approach of danger, when they happened to be caught away from one of these *Parrot-fruit* trees. These latter have no common name; botanists know it as *Pileus conica*."

Mr. Beebe states (p. 387) that this species is numerous in the barrancas and in the lowlands.

Petz's Conure is a rarely imported though desirable little Parrot. The first two to reach the London Zoological Gardens were purchased in June, 1869, since which time a few others have been added from time to time.

Caroline Conure (*Conuropsis caroliensis*).

Green, paler on under-surface; scapulars, greater wing-coverts, and inner secondaries olivaceous; bend of wing and front edge yellow; primary-coverts dark green; primaries yellowish at base of outer webs; head and upper part of neck yellow; forehead, lores, orbital region, and cheeks orange; greater under wing-coverts and under-surface of flights greyish-black; thighs with a few orange feathers; tail below olive, the outer webs of the feathers more or less dusky; beak whitish horn-colour; feet yellowish flesh-colour; irides brownish-grey. Female with the orange on the head more restricted, the beak narrower and slightly shorter. Hab., formerly widely distributed, but now restricted to the Gulf States and the Lower Mississippi Valley, and only occurring locally.

Major Charles Bendire ("Life Histories of North American Birds, Vol. II., pp. 1-6) gives a very full account of this Parrakeet, from which I cull the following: "With the more general settlement of the regions inhabited by these birds, their numbers have gradually but steadily diminished, and even as early as 1832 Audubon speaks of their not being nearly as common as formerly. As late, however, as 1860 they were still comparatively numerous throughout the Gulf States and the Mississippi, Arkansas, and White River valleys; and I well remember seeing large flocks of these birds throughout that year in the vicinity of Fort Smith, Arkansas, and near several of the military posts in the Indian Territory.

"Although rather restless birds at all times, they can generally be considered as residents wherever found, roving about from place to place in search of suitable feeding grounds, and usually returning to the same roosting-place, some large hollow tree, to which they retire at night, hooking or suspending themselves by their powerful beaks and claws to the inner rough wall of the cavity.

"Previous to the more extensive settlement of the country, their food consisted of the seeds of the cocklebur (*Xanthium strumarium*), the round seed balls of the sycamore, those of the cypress, pecan and beech nuts, the fruit of the papaw (*Asimina trilobata*), mulberries, wild grapes, and various other wild berries. According to Mr. J. F. Menge, they also feed on the seeds extracted from pine cones and those of the burgrass, or sand bur (*Cenchrus tribuloides*), one of the most noxious weeds known. They are also rather fond of cultivated fruit, and in Florida they have acquired a taste for both oranges and bananas. They are also partial to different kinds of grains while in the milk. Mr. Frank M. Chapman states that while collecting on the Sebastian River, Florida, in March, 1890, he found them feeding on the milky seeds of a species of thistle (*Cirsium lecontei*), which, as far as he could learn, constituted their entire food at that season."

Among other things, the red blossoms of the maple (*Acer rubrum*), osage, orange-fruit, and buds and corn in the milky stage are also mentioned. He continues:—

"Their flight, which is more or less undulating, resembles both that of the Passenger Pigeon and again that of the Falcons; it is extremely swift and graceful, enabling them, even when flying in rather compact flocks, to dart in and out of the densest timber with perfect ease. Their call-notes are shrill and disagreeable, a kind of grating, metallic shriek, and they are especially noisy while on the wing. Among the calls is one resembling the shrill cry of a goose, which is frequently uttered for minutes at a time. Formerly they moved about in good-sized and compact flocks, often numbering hundreds, while now it is a rare occurrence to see more than twenty together, more often small companies of from six to twelve. When at rest in the middle of the day on some favourite tree they

sometimes utter low notes, as if talking to each other, but more often they remain entirely silent, and are then extremely difficult to discover, as their plumage harmonises and blends thoroughly with the surrounding foliage."

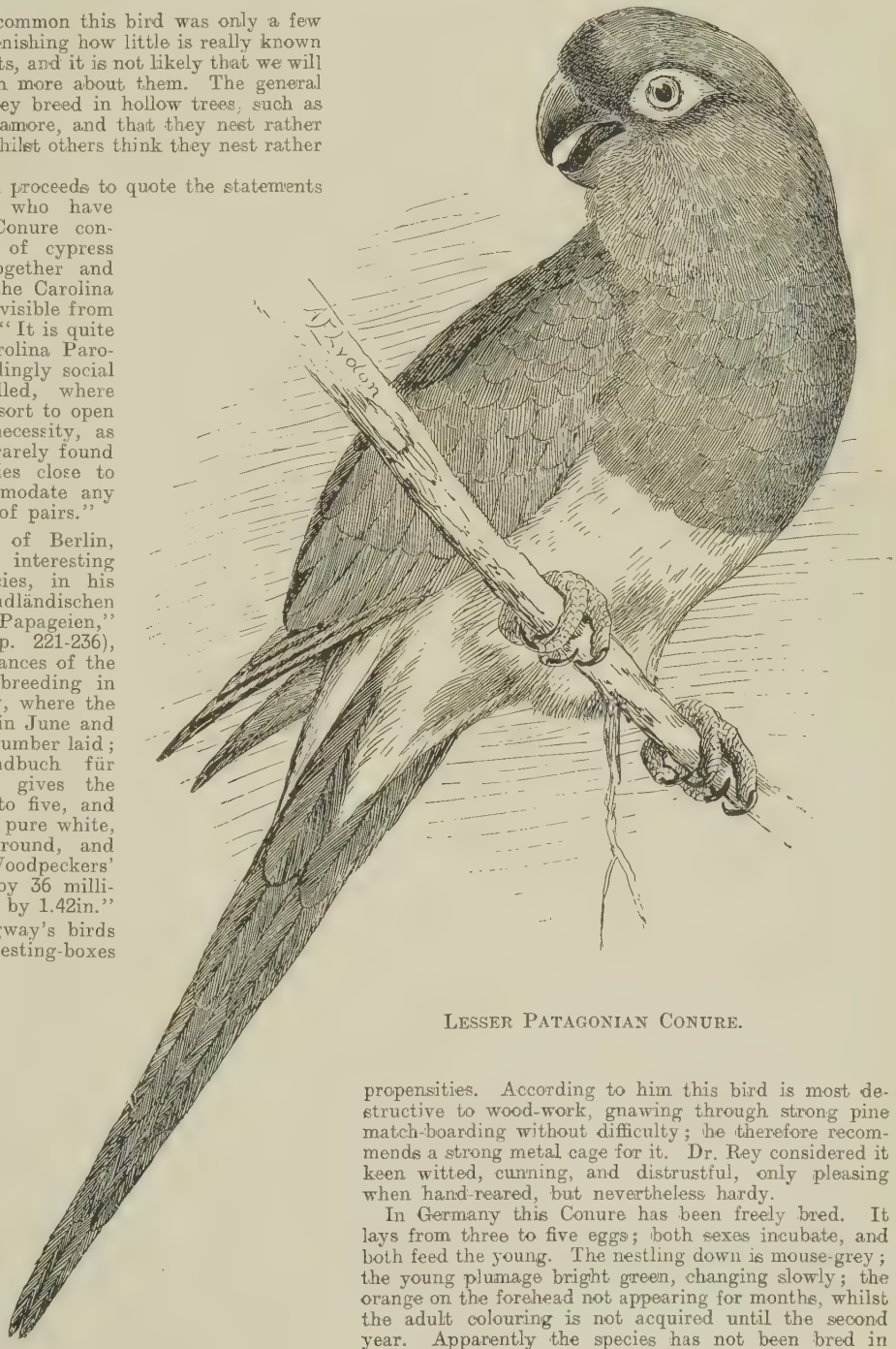
"Considering how common this bird was only a few decades ago, it is astonishing how little is really known about its nesting habits, and it is not likely that we will be able to learn much more about them. The general supposition is that they breed in hollow trees, such as cypress, oak, and sycamore, and that they nest rather early in the season, whilst others think they nest rather late."

Major Bendire then proceeds to quote the statements of various persons who have asserted that this Conure constructs flimsy nests of cypress twigs loosely put together and resembling nests of the Carolina Dove, the eggs being visible from below, and he says: "It is quite possible that the Carolina Paroquet, from its exceedingly social nature, was compelled, where very numerous, to resort to open nesting sites from necessity, as suitable cavities are rarely found in sufficient quantities close to each other to accommodate any considerable number of pairs."

"Dr. Karl Russ, of Berlin, Germany, in his interesting article on this species, in his work on "Die Fremdländischen Stubenvögel—Die Papageien," Vol. III. (1879), pp. 221-236), mentions several instances of the Carolina Paroquets breeding in captivity in Germany, where the eggs were deposited in June and July, two being the number laid; but in his "Handbuch für Vögelliebhaber" he gives the number from three to five, and he describes them as pure white, fine grained, very round, and quite glossy, like Woodpeckers' eggs, measuring 38 by 36 millimètres, or about 1.50 by 1.42in."

"Mr. Robert Ridgway's birds would not use the nesting-boxes provided for them, and both females deposited their eggs on the floor of the cage; they were laid in July, August, and September respectively. None of these eggs can be called round; they vary from ovate to short ovate, and are rather pointed."

Although I cannot admire the arrangement of colours on this Conure, Dr. Russ hints that, partly on account of its beauty and partly its low price, it would seem a highly desirable bird if one did not know its evil



LESSER PATAGONIAN CONURE.

propensities. According to him this bird is most destructive to wood-work, gnawing through strong pine match-boarding without difficulty; he therefore recommends a strong metal cage for it. Dr. Rey considered it keen witted, cunning, and distrustful, only pleasing when hand-reared, but nevertheless hardy.

In Germany this Conure has been freely bred. It lays from three to five eggs; both sexes incubate, and both feed the young. The nestling down is mouse-grey; the young plumage bright green, changing slowly; the orange on the forehead not appearing for months, whilst the adult colouring is not acquired until the second year. Apparently the species has not been bred in

England, and now that it has become so rare, even in its native land, there is little chance of it being bred in the future. It was first purchased for the London Zoological Gardens in 1860, since which date other specimens have been acquired.

Lesser Patagonian Conure (*Cyanolyseus patagonus*).

Dark olive-green above, the forehead somewhat darker; the wings, with blue bastard wing, primary coverts and primaries tipped with black; secondaries slightly bluish; lower back, rump, and upper tail-coverts yellow; under parts olive-green, darker on the throat; yellow on the flanks, a large whitish band crossing the throat; abdomen yellow, with a large central patch, and the thighs red. Female smaller, with the beak smaller, shorter, and broader at the base. Hab., Uruguay, La Plata, and Patagonia.

Hudson says of this Conure: "In habits it differs somewhat from most of its congeners, and it may be regarded, I think, as one of those species which are dying out, possibly owing to the altered conditions resulting from the settlement of the country by Europeans. It was formerly abundant on the southern pampas of La Plata, and, being partially migratory, its flocks ranged in winter to Buenos Ayres, and even as far north as the Paraná river. When, as a child, I lived near the capital city (Buenos Ayres), I remember that I always looked forward with the greatest delight to the appearance of these noisy dark-green winter visitors. Now they are rarely seen within a hundred miles of Buenos Ayres; and I have been informed by old gauchos that half a century before my time they invariably appeared in immense flocks in winter, and have since gradually diminished in numbers, until now in that district the Bank Parrot is almost a thing of the past. Two or three hundred miles south of Buenos Ayres city they are still to be met with in rather large flocks, and have a few ancient breeding places, to which they cling very tenaciously. Where there are trees or bushes on their feeding ground they perch on them; they also gather the berries of the *Empetrum rubrum* and other fruits from the bushes. But they feed principally on the ground, and, while the flock feeds, one bird is invariably perched on a stalk or other elevation to act as sentinel. They are partial to the seeds of the giant thistle (*Carduus mariana*) and the wild pumpkin, and to get at the latter they bite the hard dry shell into pieces with their powerful beaks. When a horseman appears in the distance they rise in a compact flock, with loud harsh screams, and hover above him, within a very few yards of his head, their combined dissonant voices producing an uproar which is only equalled in that pandemonium of noises—the Parrot-house in the Zoological Gardens of London. They are extremely social, so much so that their flocks do not break up in the breeding season; and their burrows, which they excavate in a perpendicular cliff or high bank, are placed close together, so that when the gauchos take the young birds—esteemed a great delicacy—the person who ventures down by means of a rope attached to his waist is able to rifle a whole colony. The burrow is three to five feet deep, and four white eggs are deposited on a slight nest at the extremity. I have only tasted the old birds, and found their flesh very bitter, scarcely palatable.

"The natives say that this species cannot be taught to speak, and it is certain that the few individuals I have seen tame were unable to articulate."

This species first arrived at the London Zoological Gardens in 1868; other examples have been added from time to time, and it has found its way even into the collections of private bird-owners. The late Mr. O. E. Cresswell had a specimen, respecting which he wrote an interesting account in *The Feathered World* of October 11th, 1895.

Greater Patagonian Conure (*Cyanolyseus byroni*).

Very like the preceding species, but considerably larger and with a better defined whitish band across the breast. Female larger than male, the beak shorter, more arched, and fuller towards tip. Hab., Chili. A rarely imported species respecting the wild life of which I have been unable to find any information in books in my library. It is not mentioned in Russ' "Handbook," though the Zoological Society of London purchased two specimens in 1870 and two more were received in exchange in 1873.

Slight-billed Parrakeet (*Henicognathus leptorhynchus*).

Dull green; each feather with a dusky edge; bastard-wing and primary coverts bluish-green; primaries washed with bluish towards the tips; first primary blackish, bluish towards tip of inner web; tail dull red, greenish towards tip; head rather brighter than the back, the dusky edges to the feathers broader on the crown; forehead, lores, and a small edging round the naked orbital ring, dull crimson; an ill-defined dull red patch at centre of abdomen; greater under wing-coverts and primaries below greyish black, washed with greenish on inner webs; beak and feet lead-colour; irides orange. Female with shorter beak, narrower excepting at the base. Hab., Chili.

Mr. Ambrose A. Lane (*The Ibis*, 1897, p. 50) says: "This is a very numerous species in Southern Chili, where the birds are found in large flocks, and are more plentiful in the interior. They are generally called 'Choroi' by the natives, sometimes 'Catita.'

"They feed on certain trees in the forests, to which they appear to be restricted, as they do not resort much to cultivated fields; but I was told at Rio Bueno that in some years they make incessant raids on gardens and orchards, doing great havoc when the fruit began to ripen."

This curious-looking bird, in the character of its head, somewhat reminds one of the slender-billed Cockatoo; a good illustration of it is given in Mr. Seth-Smith's useful book ("Parrakeets," p. 58). One cannot help wondering whether the long slender bill is put to a similar use to that of the Cockatoo.

H. leptorhynchus is rarely imported, but a specimen was purchased for the Regent's Park Gardens in 1870. Russ says of it: "According to von Bock, in its native country the young are taken out of the nest, reared, and tamed; it learns to speak very little." "It seems to be extremely abundant; therefore it is marvellous that it is not oftener imported. A *leptorhynchus* in my possession became tame and confiding without trouble."

Chilian Conure (*Microsittace ferruginea*).

Dull green; each feather slightly edged with dusky; primaries with their coverts and crown slightly washed with bluish, the feathers of the latter with black edges; tail brown-red, greenish at tip; forehead, lores, and a patch at centre of abdomen dull brown-red; greater under wing-coverts and flights below greyish-black, the inner webs tinged with olive; beak and feet blackish; irides russet-brown. Female much smaller than male, the beak shorter, narrower, and less curved. Hab., Chili and Straits of Magellan.

Mr. Ambrose A. Lane (*The Ibis*, 1897, pp. 50 and 51) says: "I found this Parrot in large flocks in the

forest part of Maquegua, and subsequently about Valdivia." "The natives eat these Parrots when they can get them.

"Their habits are similar to those of *H. leptorhynchus*, and they utter the same discordant cries, and appear to be confined to the forests, feeding on similar trees."

Captain Richard Crawshay says ("Birds of Tierra del Fuego," p. 37): "The existence of such a bird as this Parrot in these high latitudes as reported by the early voyagers was for a long time discredited.

"It is common in flocks in the more open portions of the forest to the south of Useless Bay. Unfortunately, I did not at once secure specimens when I could very well have done so; ultimately, on visiting the places where I had seen them, I could not again come across any.

"It is plentiful in the forest behind Punta Arenas on the Patagonian mainland, but I never succeeded in finding more than their feathers.

"On the survey of the 'Adventure' in 1827, Capt. King met with it in all parts of the Strait, and he says it feeds principally upon the seeds of the Winter's-bark.

"At Sara Settlement, Mr. Rigby had a pair of these birds tame, which had been taken from a nest at the head of the Rio Chico."

The London Zoological Society first acquired this rarely imported Conure in 1866, and has added one or two other specimens since that date. Russ adds no information in his "Handbook."

Red-eared Conure (*Pyrrhura cruentata*).

Green; a broad dark red patch on lower back and rump; bend of wing crimson; bastard-wing and primary coverts tinged with blue, especially on inner webs; outermost primaries blue, edged with green on outer webs, olive on inner webs; tail olive, the lateral feathers washed with brownish-red on inner webs; crown and nape brownish-black, the feathers, especially on the nape, edged with buff-yellowish; edge of forehead, lores, orbital ring, and ear-coverts brownish-red; a yellowish-orange patch on sides of neck; cheeks and chin green; throat and a narrow collar round back of neck blue; a bright red patch on centre of abdomen; flights below grey, the base of their inner webs and the greater under coverts olive; tail below brownish copper-red tipped with olive; beak horn-brown; feet dusky; irides yellowish-orange. Female smaller, the beak broader, rather shorter, less arched, narrower at base when seen in profile. Hab., "South-eastern Brazil, from Bahia to Rio Janeiro." (Salvadori.) I have discovered no notes on the wild life of this species. It is very rarely imported, but two specimens were purchased for the London Zoological Gardens in 1869, and others have been added more recently.

Red-bellied Conure (*Pyrrhura vittata*).

Green; feathers of lower back edged with brown-red, forming a patch of that colour; primary-coverts slightly washed with bluish; outermost primaries blue, excepting a green edging to the outer webs and a green tinge towards tip; tail more or less coppery-red towards the tip and on the inner webs of the feathers, but the tip itself green like the whole of the rest of the tail; a narrow chestnut band, sometimes ticked with red, on the forehead; a greenish-brown spot on the ear-coverts; throat and breast olive, the edges of the feathers barred with yellowish and dusky; feathers of the sides with ill-defined, dusky edges; a brownish-red patch at middle of abdomen; greater under wing-coverts and flights below blackish-grey, washed with olive on inner webs; tail below brownish-red, slightly greenish at tip; beak black-brown or dusky; feet grey ("brownish-black"—Russ); irides orange-reddish to dark brown. Female slightly smaller, the beak narrower, shorter, and with coarser terminal hook. Hab., South-Eastern Brazil, Paraguay, and Argentina.

Mr. J. F. Hamilton (*The Ibis*, 1871, p. 308) says: "I met them frequently in the neighbourhood of maize plantations, on which they commit great havoc. Along the Sao Paulo railroad flocks were frequently seen flying overhead."

Mr. J. Graham Kerr, writing on the Avifauna of the Lower Pilcomayo (*The Ibis*, 1892, p. 140) says: "Fairly abundant during autumn."

Two specimens of this rarely-imported Conure were purchased for the London Zoological Gardens in May, 1869, and others have since been added, no less than five having been purchased in June, 1883. Russ speaks of it as nervous and intractable; he records the price of it in Germany as from 15 to 20 marks for a pair, so that it would seem not to be so rare in the German as in the English market; some were, however, sold in London in 1898, three of which came into Mr. Seth-Smith's possession.

White-eared Conure (*Pyrrhura leucotis*).

The prevailing colour is green, the top of the head and nape brownish-black; the forehead and cheeks flesh-red; ear-coverts white; feathers of the breast transversely striped white and black; bend of wing, a large patch on the lower back, the tip of the tail, and middle of abdomen deep red; bastard-wing and primary-coverts greenish-blue; primaries with blue outer webs, greater under wing-coverts and quills below olivaceous-blackish; tail below coppery-reddish; beak horn-brown to black, the cere greyish-white; feet blackish-grey with black claws; naked skin round eye dull-white; iris varying from orange-yellow to red-brown. Female distinctly smaller, the beak broader, shorter, and more arched. Hab., Eastern Brazil.

According to Burmeister this species inhabits the wooded coast region, and is by no means rare; he regarded it as incontestably the neatest and most elegant of all Parrakeets.

Dr. Russ says that this species has been imported since 1871, rarely at first, more numerously in 1884, since which time it has been more abundant. It was bred in the bird-room of Prince Ferdinand of Saxe-Coburg-Gotha, at Vienna, in 1880, and by a Mr. Johns, a schoolmaster in London, in 1885, two young being produced which died before they were fully fledged. Mr. Seth-Smith ("Parrakeets," p. 61) quotes another instance of partial success in breeding the species from "Notes on Cage-Birds."

The Hon. and Rev. F. G. Dutton once owned a pair of this species, which he turned into an aviary; he says he found them wild and uninteresting, and they showed no desire to breed, therefore he parted with them.

The first two specimens to reach the Regent's Park Gardens were purchased in 1871, since which time others have been added from time to time.

Blue-winged Conure (*Pyrrhura picta*).

Green; lower back dark red; bend of wing red; bastard-wing, primary-coverts, and outer webs of primaries blue; tail above brownish-red, green at base of outer webs of feathers; forehead, lower part of cheeks, and an ill-defined band at back of nape blue; upper part of cheeks chestnut; ear-coverts sordid grey; throat and sides of neck brown, the feathers with grey-brownish

edges; upper breast greenish with pale greyish borders to the feathers; a dark red patch at centre of abdomen; greater under wing-coverts and flights below blackish washed with olive; tail below coppery-red, darker on outer webs of feathers; beak horn-brown; feet dusky. Female distinctly smaller, with the beak narrower at base, but shorter and generally fuller. Hab., Guiana and Trinidad.

Burmeister says ("Systematische Uebersicht," Vol. II., p. 176): "It inhabits dense woods, is very nervous, and is not tamed." It is extremely rarely imported, but has been exhibited more than once in the London Zoological Society's Gardens; the first specimen was purchased in 1870.

Pearly Conure (*Pyrrhura perlata*).*

Green; bend of wing red; bastard-wing and primary-coverts blue; first primary black, the others deep blue, brighter at edge of outer webs; secondaries blue, with green outer webs; tertials wholly green; outer upper tail-coverts bluish; tail brownish-red, washed with olive at base; a band on the forehead, a second across back of neck; the cheeks, front of breast, sides, vent, and under tail-coverts bluish; crown and nape brown; upper part of cheeks greenish; ear-coverts brownish-grey; throat and greater part of breast brown, the feathers with pale edges, those of the breast double-banded pale brown and blackish; a more or less defined brownish-red patch at centre of abdomen; smaller under wing-coverts red; greater ones more or less blackish; flights below blackish, slightly washed with olive; tail below dark reddish-brown, redder at base of inner webs of feathers; beak horn-brown; feet dusky. Female probably differing as in *P. leucotis*. Hab., Lower Amazon.

Burmeister gives us no information respecting the wild life of this species, nor have I been able to discover anything in the works of other authors.

The Zoological Society of London purchased two specimens of this extremely rarely-imported Conure in August, 1884.

The species which follows is of especial interest from the fact that it constructs huge nests of sticks. As will be seen by my accounts, some other Parrots make more or less successful attempts at building, and from what has been recorded by various observers respecting the Carolina Conure, one must suppose that it also frequently constructs a simple platform of twigs, upon which to deposit its eggs; but the nests built by *Myopsittacus* are elaborate domed structures formed of sticks.

Grey-breasted or Quaker Parrakeet (*Myopsittacus monachus*).

Upper parts varying from greyish to golden-green; the primaries blue, the under parts whitish, the breast feathers being greyish with paler borders; the beak dull flesh-pink; the legs grey. Owing to its habit of constantly ruffling up the feathers on the head this bird looks stouter than it really it. Female more bulky and with a much longer and more powerful beak. Hab., Bolivia, Paraguay, Argentina, and Uruguay.

In the "Argentine Ornithology," Vol. II., pp. 44 and 45, Mr. Hudson gives a very full and interesting account of the habits of this species. He says:—"The Common Green Parrakeet, called *Cotorra* or *Catita* in the vernacular, is a well-known resident species in the Argentine Republic. It is a lively, restless bird, shrill voiced, and exceedingly vociferous, living and breeding in large communities, and, though it cannot learn to speak so distinctly as some of the larger Parrots, it is impossible to observe its habits without being convinced that it shares in the intelligence of the highly-favoured order to which it belongs.

"In Buenos Ayres it was formerly very much more numerous than it is now; but it is exceedingly tenacious of its breeding places, and there are some few favoured localities where it still exists in large colonies, in spite of the cruel persecution all birds easily killed are subjected to in a country where laws relating to such matters are little regarded, and where the agricultural population is chiefly Indian. At Mr. Gibson's residence near Cape San Antonio, on the Atlantic coast, there is still a large colony of these birds inhabiting the Tala woods (*Celtis tala*), and I take the following facts from one of his papers on the ornithology of the district.

"He describes the woods as being full of their nests, with their bright-coloured, talkative denizens and their noisy chatter all day long, drowning every other sound. They are extremely sociable and breed in communities. When a person enters the wood their subdued chatter suddenly ceases, and during the ominous silence a hundred pairs of black, beady eyes survey the intruder from the nests and branches; and then follow a whirring of wings and an outburst of screams that spreads the alarm through the woods. The nests are frequented all the year, and it is rare to find a large one unattended by some of the birds any time during the day. In summer and autumn they feed principally on the thistle; first the flower is cut up and pulled to pieces for the sake of the green kernel, and later they eat the fallen seed on the ground. Their flight is rapid, with quick flutters of the wings, which seem never to be raised to the level of the body. They pay no regard to a *Polyborus* or *Milvago*, but mob any other bird of prey appearing in the woods, all the Parrakeets rising in a crowd and hovering about it with angry screams.

"The nests are suspended from the extremities of the branches, to which they are firmly woven. New nests consist of only two chambers, the porch and the nest proper, and are inhabited by a single pair of birds. Successive nests are added, until some of them come to weigh a quarter of a ton, and contain material enough to fill a large cart. Thorny twigs, firmly interwoven, form the only material, and there is no lining in the breeding chamber, even in the breeding season. Some old forest trees have seven or eight of these huge structures suspended from the branches, while the ground underneath is covered with twigs and remains of fallen nests. The entrance to the chamber is generally underneath, or, if at the side, is protected by an overhanging eave, to prevent the intrusion of opossums. These entrances lead into the porch or outer chamber, and the latter communicates with the breeding chamber. The breeding chambers are not connected with each other, and each set is used by one pair of birds."

The breeding season of this bird begins in November, and seven or eight very thin-shelled, elongated white eggs are deposited.

From an account published in *The Avicultural Magazine*, Second Series, Vol. I., pp. 181-2, of Quaker Parakeets at large in the New Forest in 1900, it seems evident that my supposition expressed in "How to Sex Cage-Birds," p. 116—that the female alone cuts the sticks to form her marvellous nest—must be

* I do not know whether the compiler of the Zoological Society's list imagined pearly to be a translation of *perlata*; the latter probably referred to the breadth of the bird

correct : with her much more powerful beak she is certainly better fitted for the work than the male.

In 1892 I had a pair of these birds, and found them amusing, though somewhat treacherous, and hard biters; I always took care that they bit upon my thumb-nail, and when the pressure got too hard I squeezed the under side of the lower mandible, which made them let go at once.

shrieking of the larger Parrots; it is nothing more than a combination of the cawing of a Rook with the yapping of a small dog.

After I had kept my birds for some little time in a cage, I thought I would try them in an aviary. They seemed to enjoy the change and increased liberty, and gave no trouble for a week or two; then, to my horror, when I came down in the morning I found my birds

Passerine Parrakeets.

Quaker Parrakeets are fond of a game; they play with one another, with a bit of stick, or one's finger, like a couple of lively puppies, and, although at times they are noisy, it is only for lack of something more entertaining to do. A tin full of seed, or a piece of wood, will stop their noise at once. The singing of an English Thrush generally starts them off, and they squall until they are tired; but the din made by Quaker Parrakeets is melody compared with the horrible

in the adjoining aviary. With their powerful beaks they, or perhaps it was the female alone, had cut a circular piece about four inches in diameter out of the tolerably strong iron wire netting, and were disporting themselves among much smaller birds. I bundled them back, patched up the hole, and hoped for better things, but now they started at the back of their aviary, cut out a large piece of wire, and got between the wirework and the glass at the back of a greenhouse.

I found they had eaten a lot of white-lead putty, but they were none the worse for it. I now returned them to their cage, and some time later disposed of them to some one who admired them. Since then I think I have seen them on one or two occasions at the Crystal Palace.

The Quaker Parrakeet is rather dainty, always eating its favourite seeds first; it begins with sunflower seed, then hemp, thirdly canary, fourthly millet, and lastly oats; maize it simply throws out untouched; it shakes its head at acid fruits, but is fond of stale bread and raw carrot.

This is one of the most freely imported of the Parrakeets, and, consequently, is never expensive. It first reached the Zoological Gardens of London in 1859, and since that date some dozens of specimens have been added to that collection. Mr. Seth-Smith recommends as food for this bird ("Parrakeets," p. 70): "Canary, millet, and hemp seed, oats, sunflower seed, and other small corn, should form the staple diet of these Parrakeets in captivity; and fruit of all kinds should be added in season." I should add—provided that acid fruit is not offered, because these birds certainly like their fruit sweet.

Lineolated Parrakeet (*Bolborhynchus lineolatus*).

Dull green, with black edges to the feathers, but those of the rump and upper tail-coverts, median and greater wing-coverts with black spots at the tips; lesser upper wing-coverts black; bastard wing blackish; primary coverts black, with green edges; front edge of wing yellowish-green; first primary black, the others with black inner webs; tail black in the centre; head brighter green than the back; forehead, sides of head, and middle of under surface of body yellowish-green; wing below black, with the inner webs of the flights bluish-green; tail below bluish-green; beak horn-yellowish-white; feet flesh-coloured. Female smaller, with less strongly spotted rump and all the black edges to the feathers narrower; the tail wholly green; the beak hardly differs in form. Hab., Southern Mexico and Veragua; possibly Venezuela.

Mr. Salvin says (*The Ibis*, 1871, p. 94): "Mr. Godman and I discovered a small flock in the Volcan de Fuego, at an elevation of about 8,000ft. above the sea level. We saw them in a tree overhanging the track to Acatenango, above the Indian huts of Calderas, and succeeded in securing three or four specimens before the rest took flight and flew away." Unfortunately this tells us nothing respecting the habits of the species when in freedom.

Mr. Seth-Smith ("Parrakeets," pp. 71, 72) says: "In captivity this species is said to be tame and gentle. It is somewhat delicate, and should never be subjected to a lower temperature than 60 deg. Fahr.

"Canary and millet seed and ripe fruit should form its staple diet."

Russ observes ("Handbuch," pp. 196, 197): "In 1882 I received a pair from Fockelmann, of Hamburg. In the collections of Prince Ferdinand of Saxe Coburg-Gotha, of Vienna, and Mr. Blaauw, of Amsterdam, otherwise not yet imported. Mr. Blaauw's bird was very tame, uttered a song-like chattering, and spoke two French words."

Russ's book appeared in 1887, and in 1886 the Zoological Society of London acquired a specimen; in 1889 two more were added, and a fourth in 1895. Of late years it has been more freely imported, and I had the pleasure of seeing a pair in Mr. Seth-Smith's collection.

Blue-winged or Passerine Parrotlet (*Psittacula passerina*).

Deep green, the cock bird with ultramarine blue on the rump and wing, the face emerald green, the under parts lighter than the upper; beak and feet flesh-coloured. The hen is slightly smaller, entirely green, the head and neck being tinted with greyish; her beak is more arched and rather blunter. Hab., Brazil, between Cape St. Roque and the mouth of the Amazon.

Dr. Finsch says that this species is always gregarious in its own country, and flies about in vast flocks; it inhabits the wooded coast, country, or brushwood on the plains; it is abundant even in the neighbourhood of human habitations. Its favourite seed when wild is that of tamarind trees. Its song is a fine whistling, and its call-note is not unlike that of a Sparrow. This author also says that even in its own country it is a delicate bird in captivity, and difficult to keep in a cage. As regards the last part of this statement, it may be well to add the testimony of Herr August Wiener: "When newly arrived the Brazilian Lovebird is rather delicate, but with a little care the species becomes quite hardy," which is not more than might be said of half the birds that are imported from the tropics. The Passerine Lovebird, or Blue-wing, as it is sometimes called, has been bred in captivity by Dr. Russ and other German aviculturists, but in Great Britain attempts to breed it have generally been less successful. Mrs. Rathborne (*The Avicultural Magazine*, Second Series, Vol. I., p. 33) says: "Our Blue-winged Lovebirds also bred in a log-nest out of doors while we were away, but on our return we found five dead young ones fully feathered in the nest. I fancy rain must have got in and drowned them."

Although often called the Blue-winged Lovebird, it is not allied to the true Lovebirds, though from its small size and short tail, the affection of the sexes to one another, and the fact, vouched for, that males of this species will pair with female Lovebirds, its affinity to the Old World group might well be assumed.

I think it was either in 1903 or 1904 that I purchased a pair of Passerine Parrotlets, and turned them into a flight-cage, at the back of which I had fixed a small log-nest, in the hope of breeding the species. Unfortunately the hen speedily died, and the cock for some time was doomed to a solitary existence. It has been asserted by sentimental writers that the so-called Lovebirds (including the Blue-wing and the Budgerigar, as well as the true Lovebirds) speedily pine away if kept alone in a cage, but this I have on several occasions proved to be a pure myth. My Passerine Parrotlet was quite happy by himself, but at the beginning of 1905 I turned him into one division of my smallest aviary with two hens of the Madagascar Lovebird, and (unluckily for himself and his choice) he selected as his mate the smaller and weaker hen of the two. Shortly afterwards, in a fit of jealousy, the stronger bird killed the weaker and gnawed away half her skull. She then made up to the Parrotlet, but he persistently refused to breed with her, though apparently friendly enough. In 1906 she lost her temper and treated the Blue-wing as she had the hen of her own species, and in October of the same year she died. The two hens had lived together for some years before I turned the Parrotlet in with them, and therefore I rather doubt the advisability of attempting to breed the above hybrid.

The first specimen of this common species to reach the London Zoological Gardens was presented in 1858.

Blossom-headed Parrakeet.

Quaker Parrakeet.

Ring-necked Parrakeet.

GUIANA PARROTLET (*Psittacula guianensis*).

Green; lower back and rump emerald-green, sometimes washed with blue; upper tail-coverts yellowish-green; outer edges and tips of greater upper wing-coverts emerald-green, the outer ones sometimes tinged with cobalt-blue; innermost primary coverts deep blue; metacarpal edge bluish-green; tail with yellow inner webs to the feathers; hind neck tinged with greyish; forehead and sides of head emerald-green; under parts yellowish-green; under wing-coverts deep blue, partly tipped or edged with bluish-green; axillaries bluish-green tipped with deep blue; flights below with greenish inner webs; beak whitish; feet flesh-coloured; irides brown. Female green, with brighter rump, the sides of head and under-surface yellowish-green; inner webs of flights below greenish. Hab., "Guiana (?), Venezuela, Trinidad Island, Colombia, and Amazons Valley from Rio Brancho to Diamantina Creek and Santarem." (Salvadori.)

The form from the Lower Amazons is now separated as *P. deliciosa*. Mr. E. W. Harper (*The Avicultural Magazine*, New Series, Vol. VI., p. 36) says: "The Guiana Lovebirds (*Psittacula guianensis*) appear to be all imported from the neighbouring colony of Dutch Guiana; they breed freely in captivity in quite small cages, the cock being very fussy when he becomes a father. Although, owing to the 'safety in numbers,' several dozen may be put together, yet two pairs in one cage cannot agree, as I proved to my cost—one cock promptly killing the other."

Mr. Harper brought home a pair of this pretty species in 1905, and presented them to the London Zoological Society.

We now come to the genus *Brotogerys*, of which Mr. Seth-Smith writes ("Parrakeets," p. 77): "These little Parrakeets are only moderately hardy, and should therefore never be subjected to a lower temperature than 55 deg. or 60 deg. Fahr., although they may not at first seem to feel the cold."

"Their food should consist chiefly of canaryseed and ripe fruit, but white and spray millet may be added in small quantities, and plain biscuit, given in strict moderation, is much appreciated by some species."

ALL-GREEN PARRAKEET (*Brotogerys tirica*).

Green; somewhat yellowish on the under parts; the primary-coverts and primaries are blue, whilst the greater under wing-coverts and basal half of the inner webs of the quills below are bluish; the two central tail-feathers are bluish, and the remaining feathers have narrow yellow edges to their inner webs; the beak is reddish flesh-coloured with whitish cere; the feet brownish-flesh; iris brownish-grey. Female smaller, her beak shorter and broader, more bell-shaped when viewed from above. Hab., Eastern Brazil; perhaps also British Guiana.

Burmeister describes the female as less brightly coloured and bluer than the male. He says that the species inhabits the entire forest region of the Brazilian coast, where it is one of the commonest birds. He adds: "We were frequently brought living specimens, which are eagerly captured and kept in rooms—that is to say in the small townships. Of its manner of life there is nothing special to record." It is said to do considerable injury to the grain crops.

Dr. Russ says that this bird is universally known, but little admired. It was rare until 1873, when it was first imported in considerable numbers by W. Schlüter, of Halle, and Gudera, of Leipzig, since which it has been common in the market. He says it may be wintered in an unheated enclosure, or even out of doors. It has been freely bred. Parson Hintz, of Rastenburg, in 1882 reared a brood of four young; then Prince Ferdinand of Saxe-Coburg-Gotha and others followed. Herr Hintz's birds gnawed a hole in the ceiling of the bird-room and laboriously carried out a quantity of plaster. They were little heard or seen during incubation, fed quickly, and disappeared again without noise until the succeeding day. With Mr. Graeff, jun., this species nested for several years with abundant results "in a large flight-cage." (Flughecke.) *

Mr. Phillipps informs us that this bird, which Dr. Russ seems not to care for, is said to make a delightful pet; if so, it is worth breeding, but so far I have not heard of anyone breeding it in this country. The young are greyer than the adults, and show no blue in their plumage, according to Burmeister. The first specimens to reach the London Zoological Gardens were presented in 1862, after which others were obtained from time to time.

CANARY-WINGED PARRAKEET (*Brotogerys chiriri*).

Green, slightly paler below; bastard-wing and outer greater-coverts bright deep-yellow; primary coverts deep blue; great under wing-coverts and inner webs of primaries below blue; tail below bluish; beak fleshy horn-coloured; feet brownish horn-coloured; iris dark brown. Female with a narrower beak, without lateral angle at end of cutting edge of upper mandible, when viewed from above. Hab., South-Eastern Brazil, Matto Grosso, Bolivia, the Upper Amazon, and East Peru.

Edward Bartlett, speaking of this bird, as observed by him in Eastern Peru, says that it "breeds in the white ants' nests, and is found in flocks about the banks of the rivers and towns. The eggs are white, and from five to six in number."

Dr. Russ seems not to have personally possessed this Parrot, but he informs us that one in the possession of Dr. Luchs, of Warmbrunn, learned to speak several words.

By some this Parrakeet has been accounted specially noisy, but Mr. Phillipps thinks it is not more so than its allies.

The London Zoological Society purchased an example of this bird in 1868, but it seems rarely to reach this country.

WHITE-WINGED PARRAKEET (*Brotogerys virescens*).

The adult male is deep grass-green above, the under parts being slightly paler and yellower; the forehead, lores, and upper parts of cheeks tinged with bluish-grey; first primary black, with edge of outer web and tip blue; three succeeding primaries blue, with green outer edge; bastard-wing and remaining flights white, the secondaries slightly yellowish; greater coverts yellow; greater under wing-coverts, inner webs of first four primaries below, and under-surface of tail bluish-green; beak pale yellowish horn-coloured; feet flesh-brownish; iris brown. Female with thicker beak, with less defined culmen, and without the defined angle at the end of the cutting-edge of the upper mandible, as viewed from above. Hab., the valley of the Amazon from Para to the Andes of Peru.

Burmeister says that nothing special is known as to the wild life of this bird. According to Russ, it was recognised by Buffon as a talking bird.

* See notes by Mr. Reginald Phillips in the *Avicultural Magazine*, Vol. IV., p. 18.

Mr. Walter Goodfellow (*The Ibis*, 1902, p. 220) says : "A very common bird on the Lower Napo, but unknown on the upper parts of the river. On our canoe-journey down the stream we found it congregating along the banks by thousands in the evening. If disturbed the flocks flew around with such deafening cries that it was impossible to hear each other speak. The Indians delighted in disturbing them. They roosted in trees growing in marshy ground and where the river-banks were less dense than elsewhere. They were nesting on the Maranôn in August."

This is by no means a common species; indeed, Mr. Phillipps speaks of one in his possession as the only living example he has seen, and he was informed that it was the only one in Europe; it has, however, on several occasions, been an inhabitant of our London Zoological Gardens, a specimen having been purchased as long ago as 1862, a second presented in 1870, a third purchased in 1871, and the illustration in Mr. Seth-Smith's "Parrakeets" was drawn from an example living in the Gardens, probably in 1902.

Orange-flanked Parrakeet (*Brotogerys pyrrhopterus*).

The male above is dark green, below more yellowish; the forehead, lores, chin, and cheeks grey; crown bluish-green; outer webs of flights bluish, inner webs broadly blackish with narrow yellow edges; greater coverts and bastard wing dark blue; under wing-coverts deep orange; beak pale flesh-coloured; feet flesh-coloured; iris brown. Female apparently smaller, and with shorter beak. Hab., Western Ecuador and North-Western Peru.

Stolzmann says (Taczanowski's "Ornithologie du Pérou, Vol. III., p. 205) : "Occurs in large flocks; all the pairs are mixed during flight. As noisy as the other Parrakeets, they love to assemble on the same tree when its food attracts them. The inhabitants assert that it nidificates in the nests of termites, which has been proved in the case of several other species. From Guayaquil a great number of these Parrakeets is supplied for the whole Peruvian coast; it is said that it learns to talk, but I have never met with an instance. Those which are reared imitate fowls. I have had an opportunity of verifying its hatred of the little Parrakeet of the coast (*Prittacula cœlestis*), for on placing one in their cage they flew down in a great rage and began to attack it; then, when that Parrakeet was wounded, they mangled it in an atrocious manner. The sight of a cat or an owl frightens them extremely. In the month of April M. Jelski has seen the young completely fledged. Its name is *perico*."

Mr. Walter Goodfellow (*The Avicultural Magazine*, First Series, Vol. VI., p. 68) says : "The Ecuadorians seem to take no interest whatever in the bird life which surrounds them on every side, and it is quite the exception rather than the rule to find them keeping birds in captivity, and when they do their ambition does not soar beyond a Parrot. However, at times in Guayaquil birds are offered for sale in fair quantities, even if the varieties in vogue are limited. No doubt the European population has caused a certain demand for them there, and prices range very cheap indeed—1 real (2½d.) or 2 reals each seems to be the usual price for almost any bird. At the former price can be bought any number of the little Orange-flanked Parrakeets, and very tame indeed they all seem. These birds are exceedingly common in the neighbourhood, and can be met with almost anywhere in vast flocks. 'Paviches,' they are locally called. They commit great damage in the banana plantations, and bananas seem to be their staple food in captivity."

Dr. Russ says that this is one of the rarest species. Mrs. Strutzky, of Berlin, had one for nine years which had previously been in captivity six to eight years. It was very tame, sensible and pleasing, spoke several words, and could laugh like a human being.

Although formerly rare in the market, this very noisy little species is now pretty freely imported, yet is still expensive. The first specimens exhibited at Regent's Park were purchased in 1862, since which date several others have been acquired.

Tovi Parrakeet (*Brotogerys jugularis*).

Green above, more yellowish below; the head scapulars, lower back, rump, two central tail-feathers, and abdomen more or less bluish; lesser upper wing-coverts olive brown; primary-coverts deep blue; an orange spot on the chin; lesser under wing-coverts yellow; beak, pale brownish flesh-coloured; feet yellowish flesh-coloured; iris brown. Female with narrower, shorter and more arched beak. Hab., South Mexico, Central America, and Colombia.

This is a common species which, like many other Parrakeets, feeds partly upon fruit in its wild state. It breeds in nests of the white ant. Mr. Walter Goodfellow (*The Ibis*, 1902, p. 220) says : "Fairly numerous on the upper parts of the Napo, but not seen by us on the lower parts of the river. We saw young in the possession of the Indians in April."

Although not infrequently imported and bred by several German aviculturists, Dr. Russ, in his handbook, was unable to give any details as to the breeding; he, however, tells us of one specimen which learned to speak several words distinctly from an Amazon Parrot.

Mr. Phillipps speaks of a very tame pair of this species which he possessed, and which used to follow him and settle on his head and shoulders. The Zoological Society purchased its first specimen of the bird in 1872; oddly enough, although this seems to be one of the most charming representatives of the genus, very few examples have found their way to the Regent's Park Gardens.

Golden-fronted Parrakeet (*Brotogerys tuipara*).

The male is green with somewhat lighter under-surface; forehead, chin, and primary coverts, orange; flights deep blue, tipped and edged with green; greater under wing-coverts and inner webs of flights below blue; lateral tail-feathers with their inner webs edged with yellow; beak and feet horn-whitish; naked skin encircling eye broad and bluish-white; iris deep brown. Female with longer beak, less arched, and not showing a defined angle at end of cutting edge of upper mandible when viewed from above. Hab., Lower Amazons.

Dr. E. A. Goeldi, in an article on an expedition up the Capim River (*The Ibis*, 1903, p. 481), says : "The beautifully orange-marked *Brotogerys tuipara* was observed opening the fruits of a gigantic Mongúba tree (*Bombax monguba*) in search of the seeds, and its crop was filled with masses of the substance thence procured. The same predilection for Mongúba seeds I had already observed several times in Pará."

Although not frequently imported, this Parrakeet was living in our Zoological Gardens in 1879, and Mr. Phillipps has possessed two females, which he describes as very timid birds. One of these paired with a Musky Lorikeet, and laid four clear eggs, which are described as "round ovals of large size, larger than those of the Golden-shouldered Parrakeet, but not exhibiting the slight inclination to quince-shape of most of the eggs of the Tovi with which I was favoured

some years ago." (*The Avicultural Magazine*, First Series, Vol. VI., p. 142.)

Mr. Seth-Smith also obtained a specimen in 1906, which he at first paired up with a Musky Lorikeet; but, as the latter plucked out his wife's feathers, they were separated, and she was subsequently paired with a Tovi Parrakeet, with which she lived happily.

GOLDEN-WINGED PARRAKEET (*Brotogerys chrysopterus*).

Differs from the preceding species in having the forehead and chin brown instead of orange; it is also rather smaller. Female with the beak narrower at base, with less defined culmen, also longer and without indication of angle at end of cutting edge of upper mandible when viewed from above. Hab., Guiana, Venezuela, and Trinidad.

I have found no notes on the wild life of this rarely imported species. The Zoological Society of London first received an example in exchange in 1878, and at least one specimen has been added to the Regent's Park collection since that date.

TUI PARRAKEET (*Brotogerys tui*).

The adult male is grass-green above, the rump, upper tail-coverts and under surface somewhat paler and yellower; front of head, lores, and a streak behind the eye yellow; bastard wing blue with green outer webs to the feathers; primary coverts bluish; inner webs of flights blackish above, bluish below; greater under wing-coverts blue; beak dark yellowish brown; feet clear horn grey, the claws darker; iris brown. The female has no yellow streak behind the eye; her beak also is narrower and shorter than in the male. Hab., Western Brazil, the Upper Amazons, Eastern Ecuador, and Eastern Peru.

According to Edward Bartlett ("Proceedings of the Zoological Society," 1873, p. 300), this species, like *B. xanthopterus* and *B. jugularis*, breeds in the white ants' nests.

Mr. Walter Goodfellow (*The Ibis*, 1902, p. 220) says: "First seen by us on the Lower Napo near the mouth of the Curari. Just after we entered the Marañon our Indians discovered a nest a little way off in the forest. It was about twenty feet from the ground, in the hollow of a branch. It contained five young, some almost fully fledged, while others had hardly a feather on them. I reared several of these, and brought them to England with me." Mr. Goodfellow gives a fuller account (in which, however, he says that *six* young ones were obtained from the nest) in *The Avicultural Magazine*, First Series, Vol. VI., p. 126. It appears that they fed readily on banana until that gave out, and then, as readily, took to canaryseed. One pair was brought home; he found them tame and affectionate.

Dr. Russ says that this is one of the smallest and most beautiful of the small-beaked Parrots. He found a pair which he turned into his bird-room uncommonly pleasing and lovable, and their chattering neither shrill nor unpleasant, but on the contrary comical; they were peaceable towards smaller associates. Although they took possession of a nest-box they did not breed.

Mr. Phillipps expresses similar satisfaction with three examples which he has owned; he, however, considers it a delicate bird and one difficult to get into good plumage.

Although still rare in the market, this little bird is more often imported than formerly; it is, however, unfortunate that it should be the least hardy of its genus, since otherwise it has everything to endear it to its owners. The Zoological Society of London secured its first specimen in 1862, and has since owned several others.

CHAPTER XI

SUB-FAMILY PIONINÆ.

Amazons, Caiques, etc.

The Amazon Parrots are characterised by a rather short, broad tail about half the length of the wing. The oil-gland is not tufted; the under-surface of the hook of the upper mandible has a roughened file-like surface; the cere which surrounds the entire base of the beak is naked, and swollen in front of the nostrils. The Amazons are confined to tropical America; they are noisy but intelligent birds, of rather large size, and with bright green as the prevalent colour; they are somewhat treacherous, but very gifted as talkers, and consequently are general favourites. In their wild state they appear to nest rather high up in the hollow branches of lofty trees; they are very destructive to fruit. In captivity a dry seed-mixture, consisting of one part wheat to two each of dari, sunflower, and canary, seems to suit them best; but a little maize, boiled for two hours, should be added once or twice a week; nuts should be given in winter (the best being Barcelonas or walnuts removed from the shells), and in summer peas in the pod; banana, ripe grapes, apple, or orange should be given daily, and, for variety, occasionally a piece of plain dry biscuit. On no account should any form of animal food, any form of sop or squashy food be given, nor should any of the mixtures advertised under the misleading title of "Parrot Food" be given to these or any other Parrots, inasmuch as they are suited to the requirements of none; in fact, the very supposition that it is possible to prepare a general food for an order of birds which varies so greatly in the nature of its food as the *Psittaci* is preposterous on the face of it.

As it is most important, in order to keep Parrots in good health and plumage, that each group should be fed according to rule and on the most suitable food, so it is equally important to avoid unnatural drinks. It is a common error with owners of Parrots to offer them some of the drink which they happen to be themselves partaking of—usually milk, tea, coffee, cocoa, or chocolate, though two instances have come under my notice in which the unfortunate birds have been given beer. Pure water only should be given, excepting, of course, in case of illness, when some medicine or stimulant may be temporarily added. To give unwholesome food or drink is to undermine a bird's constitution, causing indigestion and all other ills to which the feathered tribe is liable.

Should an Amazon catch cold, put a few chillies among its seeds and a few drops of tincture of iron with a little glycerine (eight drops) in its drinking water. A nasal douche, consisting of one part glyco-thymoline to nine parts water, is also an excellent remedy.

GUILDING'S AMAZON (*Chrysotis guildingi*).

Copper brown, with black edges to the feathers; bastard-wing and primary-coverts green, the first somewhat bluish, the last orange at base of outer webs; primaries black, yellow at base; secondaries blue, edged with green, first three or four secondaries orange at base, basis of inner secondaries yellow; tertials partly green; edge of wing yellowish-orange in front, yellowish-green behind, the edges of the feathers blue; tail above with the base yellow and orange, the middle blue, the tip yellow; crown white, shading into yellow behind; lores and feathers below the eyes white; back and sides of head and throat blue, with the bases of

the feathers yellowish-green; lower neck more or less greenish; feathers of abdomen green towards the black edges; under tail-coverts greenish-yellow; smaller under wing-coverts orange varied with green; greater coverts and bases of inner webs of flights below yellow; tail below orange at base, green in the middle, yellow at tip; beak pale horn-colour; feet grey. Female with a much broader beak with less arched culmen. Hab., St. Vincent, West Indies.

This is one of the most beautiful of the Amazon Parrots, as may be at once seen by a reference to the charming coloured plate published in *The Avicultural Magazine*, Second Series, Vol. II., facing p. 121; it was supposed that the eruptions at St. Vincent completely exterminated the species, and Canon Dutton says (*t.c.*, p. 122): "Now—everyone who possesses one says, 'Mine is the last of its species.' I know of five 'last of their species.' One in the Zoo, one belonging to a lady, my own, and two in the island of St. Vincent. I had an opportunity of buying one two or three years ago, but its character was not attractive, and I let it pass into the hands of Mr. Jamrach."

Mr. Clarke, an American, obtained specimens of this bird on St. Vincent in 1904; therefore we read in Mr. M. J. Nicholl's interesting book ("Three Voyages of a Naturalist," p. 140): "On St. Vincent the fine Parrot —*Chrysotis guildingi*—which is found nowhere else in the world, has not get become extinct, and is still found in some numbers on the high peaks."

This species was first purchased for the Regent's Park Gardens in 1874, and since that date several other specimens have been added to the collection; I saw one there in 1906 or 1907. It is generally regarded as rather a morose and stupid bird.

August Amazon (*Chrysotis augusta.*)

Upper surface mostly green, the feathers edged with blackish; front edge of wing and speculum crimson; primaries dark-brown, green at the base of the outer webs; outer secondaries dull purple, inner ones tipped with dull blue; tail above dull reddish-brown, vinous at tip, the central feathers and base of the lateral ones tinged with green, the outermost feather reddish-brown; head, neck, breast, and abdomen deep purplish-blue, edged with black, excepting that those of the crown are edged with dark shining green; feathers of upper breast and vent distinctly purple; sides, flanks, thighs, and under tail-coverts green, with blackish edges to the feathers and with a more or less blue tinge towards the edges; smaller under wing-coverts green, tipped with blue; greater coverts and base of inner webs of flights below dull green; tail below reddish-brown, shot with green; upper mandible deep horn-colour, marked on each side of the base with whitish; under mandible paler; feet blackish-brown. Female perhaps slightly duller in colour, the beak probably differs from that of the male as in the preceding species. Hab., Dominica, West Indies.

Messrs. G. E. and A. H. Verrill (Transactions Connecticut Academy VIII., page 315, 1892) say that *C. augusta* is said to be common among the mountains on the windward side of the island. "It was mainly to procure these Imperial Parrots, so seldom seen in collections, that our trip was made to Bass-en-ville, which is a single house in the primeval forest, and only to be reached by one of the worst trails ever travelled, and we spent a number of months among the Sierra Nevada Mountains. This trip, however, well repaid us for our trouble, as it was there we took many of our best birds and other specimens; but though Parrots were seen nearly every day, and we were accompanied by Mr. Hennessey Dupigny and another hunter, our united efforts secured but two of these shy birds in the ten days we were there."

According to Mr. A. Hyatt-Verrill, of Newhaven, U.S.A., this species is now much less common than *C. bouqueti*, a bird which (on the authority of Mr. Clark) was supposed to be extinct (cf. *The Ibis.*, 1907, pp. 365, 367). It was first presented to the Zoological Society in 1865, but it seems to be rarely imported, although Canon Dutton (*The Avicultural Magazine* First Series, Vol. VIII., pp. 151, 152) describes a specimen in his collection, and speaks of one in the possession of Lady Thompson. He says it is the largest of the Amazons, and apparently it is a good talker. The article is accompanied by an excellent coloured plate.

Vinaceous Amazon (*Chrysotis vinacea*).

Green, the feathers edged with black; long feathers of the hind neck, with a bluish-grey band near the black edges; upper tail-coverts yellowish-green; front edge of wing and speculum at base of outer webs of three first secondaries, red; first primary black, with blue outer web; the others with the outer webs green towards base, blue towards tip; tail gradually becoming yellowish-green towards tip, and with the lateral feathers bright red at base of inner, and dull deep purplish-red at base of outer webs; frontal band, lores, and chin red; breast and the abdomen more or less reddish-vinous, tinged with bluish towards the black edges of the feathers; under tail-coverts yellowish-green; greater under wing-coverts and part of inner webs of flights towards base verditer-green; beak red tipped with white; feet olivaceous-grey; irides orange. Female smaller, rather duller, the beak less bright in colour, broader, but more compressed from the nostrils forward on each side of the culmen; the latter more arched. Hab., "South-Eastern Brazil, Paraguay, and N. Argentina" (Salvadori).

Herr H. von Ihering, in his "Ornithological Notes from South Brazil" (*The Ibis*, 1901, pp. 13, 14) describes the egg of this bird as follows:—"This is an egg of 38 by 30 mm. in dimensions, and of oval form. The poles are subequal, the surface is smooth, little polished, and with some scattered deep pores. The nest from which it was taken was a hole situated very high in a colossal murta tree. The level of the nest was at 2 m. below the entrance, and to obtain the eggs it was necessary to make a second opening with an axe."

In Sclater and Hudson's "Argentine Ornithology," Vol. II., p. 47, we read:—"White gives us the following notes on its habits: Both in Concepcion and San Javier these Parrots are found in incredible numbers feeding in the orange-groves which cover and enclose the extensive Jesuit ruins in those parts of Misiones. They seem to be very voracious, as they feed all day long, and the inhabitants shoot them for food; but they are not easily scared, for on hearing a shot they only fly up in clouds to descend again, meanwhile making the air resound with their shrill cries. They can be be taught to talk tolerably well if taken young."

Russ gives the price of this Amazon in Germany as from 50 to 75 marks when freshly imported; it is therefore evidently a rare bird in the European market, yet several examples have been exhibited in the London Zoological Gardens.

Blue-faced Amazon (*Chrysotis versicolor.*)

Green, the feathers conspicuously edged with black, especially on the upper surface; upper tail-coverts yellowish-green; front edge of wing also yellowish-

green; speculum formed by the bases of the outer webs of the first three or four secondaries, red; primaries black, but all excepting the first, and the primary-coverts, deep blue towards base of outer webs; outermost secondaries blue towards the tips; tail with a broad terminal belt of greenish-yellow, central feathers otherwise green, but the lateral feathers with the basal half of outer webs blue, deeper on the outside feather, the three outer ones also with a red spot at the base of the inner webs; front of crown, sides of head, and throat, blue; forehead, lores, and cheeks with a purple tinge; a broad red belt across the lower throat; breast and abdomen yellowish-green, each feather dull pale-red at base and towards the black edge; under tail-coverts and smaller under wing-coverts yellowish-green; greater under wing-coverts and base of inner webs of flights below verditer-blue; tail below black towards base, with three red basal spots as above; beak horn-blackish, yellowish at base of upper mandible; irides orange. Female probably with shorter beak. Hab., St. Lucia, West Indies.

I have found no notes on the wild life of this Amazon; it was formerly wrongly identified in the Zoological Society's list as C. *bouqueti*. The first example was purchased for the Gardens in 1874, and two more were obtained in the year following.

Bouquet's Amazon (*Chrysotis bouqueti*).

Green, the feathers with black edges; upper tail-coverts yellowish-green; primary coverts blackish-green tinged with blue at the tips; first primary black, the others deep blue at base of inner webs and tinged with green at the edges; first three secondaries with a red spot at base of outer webs, forming a speculum; all the secondaries tinged with blue towards the tips; lateral tail-feathers with a broad greenish-yellow belt at the tips; central feathers with narrow tips of the same colour; first four feathers red at base of inner webs, outer feather with blue edging to the base of the outer web; forehead, lores, orbital region, front of cheeks, and throat purplish-blue; a red spot on middle of lower throat; greater under wing-coverts verditer-green; flights below with the inner webs verditer-blue; under tail-coverts yellowish-green; tail below with the terminal half yellowish-green, the inner webs of the lateral feathers red at base; beak pale horn-colour, yellowish at base of upper mandible; feet dusky; irides orange. Female not differentiated. Hab., Dominica, West Indies.

As already noted, Mr. Clark stated that this species was extinct. In reply to this Mr. A. Hyatt-Verill wrote to Count Salvadori (see *The Ibis*, 1907, pp. 365, 366) as follows: "During the past three years I have resided in Dominica, and have made extensive collections of the birds. I have found *Chrysotis bouqueti* particularly abundant and easy to procure, and have secured over forty specimens. Graf von Berlepsch has a number which I sent him, and others were disposed of to various collectors. This species is increasing rapidly, and spreading over the whole island. On a former visit, fifteen years ago, I found Bouquet's Parrot much rarer than *C. augusta*, whereas at the present time it is far more common. The birds are found within a few miles of Roseau, and are particularly abundant in the Lagoon valley in the central part of the island, where they are very tame and feed near the houses of the planters in enormous flocks. In fact, at that place I have shot them from the verandahs of the houses. They are killed in large numbers for the market, and during the open season can be bought for 1s. each.

"How Mr. Clark could have been misled into supposing this Parrot extinct is inexplicable to me."

Although this bird appears never previously to have reached the London Zoological Gardens (the species entered under that name in the list having, as already stated, been *C. versicolor*), the Hon. and Rev. Canon Dutton received a specimen in June, 1900, which he subsequently sent to the Gardens. He says of it: "My bird was tame enough to let me scratch its head, but beyond that had nothing to recommend it. It was not affectionate, it never said a word, and uttered ceaselessly a cry which, although unlike that of any other Amazon, was not the less wearisome on that account." (*The Avicultural Magazine*, First Series, Vol. VII., p. 110.) An excellent coloured plate accompanies Canon Dutton's article.

Guatemalan Amazon (*Chrysotis guatemalæ*).

Green, upper surface mealy; feathers of hind neck edged with blackish; first primary black, the rest also black, but with the basal half of the outer webs green, next to which colour the black is more or less suffused with blue; base of first four secondaries red, forming a speculum; tips of secondaries black, more or less tinged with blue; tail with the terminal half yellow or greenish-yellow; crown and stripe over eye bluish; back of crown slightly tinged with lilacine-grey; cheeks and under-surface of body yellowish-green; greater under wing-coverts verditer-blue with yellowish edges; inner webs of flights below partly verditer-green; beak bluish-black, with a yellowish or reddish spot at base of upper mandible; feet greenish-ashy; irides orange-red. Female with a broader beak, especially at the base, the terminal hook coarser. Hab., "Southern Mexico and Central America, as far as Honduras and Nicaragua (?)." (Salvadori.)

I have no notes on the wild life of this Amazon in any work in my library. Russ speaks of it as rarer in the trade than Natterer's Amazon, yet the London Zoological Society has had several examples, the first being purchased in 1870.

Mealy Amazon (*Chrysotis farinosa*).

The adult male above is green, having a mealy appearance; below paler, and yellowish on the under tail-coverts; forehead and cheeks yellowish; centre of crown yellow, frequently finely spotted with red; feathers of back of head, nape, and hind-neck edged behind with black; front margin of wing and speculum scarlet; primaries black, bluish at tips, all excepting the first green towards the base of the outer webs, between which and the black is a bluish tinge; tail with a yellowish band on its terminal half, the outer tail-feather often with its outer web narrowly edged with blue; beak pale horn-grey, cere blackish, base of both mandibles with an orange-yellowish spot; feet blackish-grey powdered with whitish, the claws black; iris brown internally, red or orange towards the outside. Female apparently with less yellow and no red on the crown, and probably with the irides paler (as is certainly the case in some, if not all, Amazons); the beak slightly broader at base, longer, and with more slender terminal hook (thus forming an exception to the general rule). Hab., Guiana and apparently Eastern Brazil.

Burmeister describes the beak of this bird as clear bluish-grey, almost white at the tip. He says that this is the largest species of its genus in Brazil and apparently in the whole of America. It is very common on the Amazon and throughout Guiana.

Dr. Emil A. Goeldi, in an article on the birds of

South Guiana (*The Ibis*, 1897, p. 158) says: "On some of the gigantic trees (such as 'Sumaúmas') we observed charming societies of . . . Parrots (such as *Chrysotis farinosa*, the 'Moleiro,' which was very frequent)."

As a cage-bird the Hon. and Rev. F. G. Dutton did not find it teachable, but Dr. Russ says: "A favoured talker, is one of the most gifted, at the same time gentle and amiable, but unhappily one of the most frightful shriekers." He states the German price as 30 to 45 marks, or, for a talker, 75, 90, to 100 marks.

The first example to reach the Regent's Park Gardens was deposited in 1863, and probably in all they have had the honour of exhibiting about a dozen specimens to the public.

Mercenary Amazon (*Chrysotis mercenaria*).

Green; feathers of the hind-neck edged with black; upper tail-coverts paler, brighter green; front edge of wing yellow more or less tinged with red; tips of flights black, more or less tinged with blue; the usual red speculum at base of first three secondaries; central tail-feathers with yellowish-green tips, lateral feathers mostly red between the green base, and greenish-yellow tips, but dark purple between the red and green on the outer webs; the second and third feathers with the inner webs red to the base, the outermost one with a blue edge to its outer web; forehead, cheeks, and under-surface paler and brighter green than the back; tail below with a reddish tinge on the lateral feathers up to the greenish-yellow tips; beak dusky, yellowish at base of upper mandible; feet brown; irides yellow. Female probably differing in form of beak as in the preceding species.* Hab., "Peru, Ecuador, and Colombia." (Salvadori.)

Stolzmann says (Taczanswski's "Ornithologie du Pérou," Vol. III., p. 222): "Parrakeet going to the greatest height in the mountains after *Conurus mitratus;* the commonest at Huambo, where one often sees great numbers arrive upon the trees. In the morning and at sunset they are most restless, especially at that last period of the day's work one sees them arrive at the place of their choice in great or small communities. There they scream, and finally, when all the company is complete, they all take wing at one signal given and retire screaming to the place where they pass the night; afterwards one sees isolated delayed pairs follow the principal community.

"When feeding they are quiet and difficult to discover. The hunter does not usually discover their presence until they fly away, thrice uttering their cry of alarm and including the entire community in their flight. I have never seen this species in captivity, for the inhabitants do not know the nesting-places. Meanwhile, I have been assured that it is sometimes reared and learns to talk perfectly. "Its flight, like that of *Chrysotis* in general, most resembles that of ducks, just as hurriedly flapping the wings. In the forest they always keep in pairs. Its name is *loro sordo*."

This rarely-imported Amazon arrived at the London Zoological Gardens in 1882. Russ thinks this is the only time in which it has been imported. ("Handbuch," p. 238).

Orange-winged Amazon (*Chrysotis amazonica*).

The adult male is green above, paler below; feathers at back of neck edged with blackish; forehead, lores and superciliary stripe blue; front of head and a spot on the cheeks from below the eye extending to the beak of shining yellow; ear-coverts grass green; first primary covert tipped with blue; wing-speculum orange-red; primaries black, all excepting the first, with green outer webs, with a blue tinge between the green and black as in the preceding species; lateral tail-feathers with the inner web orange-red almost to the tips, and crossed by a green band; outer feather with the middle of the outer web blue; beak pale horn yellowish, the tip dusky; a yellow spot at the base of the upper mandible; feet brownish horn-grey; iris cinnabar red to clear yellow. Female with shorter, less tapering and more arched beak than the male. I should think it probable that the examples with clear yellow iris would prove to be the females, and those with cinnabar or reddish-orange iris the males. Hab., Guiana, Venezuela, Trinidad, Colombia, and the Amazons.

This species is abundant in the woods and scrubs of the plain region. At night great flocks collect in their favourite roosting places, whence during the day they wander through the neighbourhood in search of food. In spring and summer the sexes of each pair are continually seen together. The species is much sought for and cherished as a pet by the natives. This is practically all that Burmeister has to say respecting the home life of the species, but from what Dr. Russ says, it appears to nest near the top of extremely lofty branchless trees (of course in holes).

C. A. Lloyd ("Timehri," New Series, Vol. IX., p. 270) says that the Indians assert that *Chrysotis ochrocephala* "frequently breeds in company with *C. amazonica*, and that young birds of both species are often taken from the same nest."

In Dr. Goeldi's notes on the birds of the Capim River (*The Ibis*, 1903, pp. 478-9) he speaks of "the deafening noise made by various Parrots, among them especially the 'Curica' (*Chrysotis amazonica*)." This confirms the late Dr. Russ's statement that it is the most irritating of screamers, though admitted to be very teachable; nevertheless, even when it talks, it does not omit to screech.

This Amazon was first purchased by the Zoological Society of London in 1873, since which time a good many examples have been exhibited in the Gardens at Regent's Park.

Blue-fronted Amazon (*Chrysotis æstiva*).

The general colour of this beautiful bird is grass-green, clearer below than above; the forehead is bright azure blue; the face, chin, and throat are occupied by a large patch of yellow; the shoulder of the wing and the third and fourth primaries are scarlet; the first and second primaries blue; the centre tail feathers washed with reddish on the inner web; beak blackish brown; feet grey; iris of eye orange. Dr. Russ, however, says that the beak is blackish-brown, with black cere, the feet bluish-grey, with black claws, and the iris varying from orange-red to yellow, and I think that he is more likely to be correct than Burmeister (who states that the beak is horn-grey, with paler culmen and pale yellow cere). Female with the beak shorter and broader at the base. Hab., Bolivia, Southern and Central Brazil, Paraguay and Argentina.

Burmeister says that this is the commonest Parrot in the forest region of the Brazilian coast. It affects the marshy headlands of the river. Its favourite fruits appear to be those of *Conocarpus* and *Avicennia;* it is also stated to do immense mischief in orange gardens, which I can quite believe.

Dr. E. Lönnberg, writing on Birds from N.W.

* Specimens without a red speculum are regarded as young by Count Salvadori, but he says they show no other sign of youth; perhaps they may be females; but I think not, for sexed females are in the Museum collection.

Argentina and the Bolivian Chaco (*The Ibis*, 1903, p. 467), says : "Iris reddish-yellow. Occurs in large flocks of several hundreds, but is very shy. In the morning and evening they fly to and from their feeding-places, making a deafening noise."

This is more freely imported than any other Amazon, and is a general favourite as it is an excellent talker; in fact, in this respect it almost equals the Grey Parrot; it is also very long-lived, so that for anyone who wants one of these big fellows as a companion this is undoubtedly the species which he should select.

Although I have never possessed it, I have met with so many at the houses of my friends that I have no hesitation in stating emphatically that I consider it far and away the most talented and most attractive of its genus.

Some years since I had occasion to call upon my old friend Mr. Abrahams, and, finding him out, I waited and had lunch with him. As we sat at table I heard, as I thought, a street arab singing the whole of the words of "Ta-ra-ra-boom-de-ay" from beginning to end, in a monotonous voice. "Do you hear it?" said Mr. Abrahams. "What, that child singing?" That tickled my friend. "Why, my good man," he said, "that's my Blue-fronted Amazon; if you wait you will hear him sing the whole of the words of a second song and then whistle a third." Sure enough the whole programme was carried out conscientiously by that clever bird, and then it started again.

The Blue-fronted Amazon is very hardy, but, like all its congeners, it is not perfect, for it is undoubtedly treacherous and noisy.

First deposited at the London Zoological Society's Gardens in 1864, this Amazon has never since been absent from that collection, in all probably considerably more than two dozen specimens have, from time to time, found a home there.

Yellow-shouldered Amazon (*Chrysotis ochroptera*).

The prevailing colour of the adult male is green, somewhat paler below than above, all the feathers with black margins; the forehead and lores yellowish-white; the crown, cheeks, sides of head, including the ear-coverts, upper part of throat, and bend of wing yellow; primaries mostly black; wing-speculum scarlet; outer tail feathers with the basal third cinnabar-red; the outer feather with blue outer web; the tips of all the tail feathers broadly yellowish; greater under wing-coverts and inner webs of quills below blue; beak horn-white; feet pale; iris orange, "reddish-brown" (Hartert). The female differs, according to Russ, in having the region of the lower mandible, the lower breast and abdomen sky-blue; all other colours duller; it is probable that it has a paler iris than the male and a shorter beak. Hab., Venezuela, perhaps Trinidad, certainly the Islands of Aruba and Margarita.

In an article by Dr. E. Hartert (*The Ibis*, 1893, pp. 301-303), he says : "This beautiful Amazon, of which, in spite of the numbers that are kept in confinement, specimens procured in a wild state are so rare in museums that its habitat could only be given with a query in Salvadori's "Catalogue of the Parrots," inhabits the Island of Aruba. It might not be out of place here to state that it is also common in the lowland forests of the district of Coro and in other parts of Venezuela, whence large numbers are sent to the bird-shops of the larger towns of Venezuela and to Curaçao."

"This Parrot is not rare in the more wooded and rocky parts of the island, but is somewhat shy and not easily to be obtained in numbers. It is said to breed in hollow trees."

Mr. P. R. Lowe, writing on the birds of Margarita Island, says (*The Ibis*, 1907, p. 557) :—"I saw some of these Parrots in the high trees above El Valle, where Capt. Robinson observed the species in large flocks, but there were also several parties round the lagoon at the west end of the island."

Dr. Russ accounts this one of the most familiar Parrots in the trade, "much beloved by many friends of feathered prattlers; whilst others despise it generally, as they do all small Amazons. Individual birds of this species are astonishingly diversely gifted with speech. Acknowledged connoisseurs have indicated certain remarkably richly endowed Little Yellow-heads (German trivial name); many will learn nothing. Behaviour entertaining; for instance, it mimics faithfully all kinds of animal voices, the crowing of cocks, the cackling of hens, the cooing of pigeons, the miawing of cats, the barking of dogs, etc.; it becomes uncommonly easily and altogether tame."

Two examples of this species were deposited at the London Zoological Gardens in 1869, since which date a good many examples have been exhibited there.

Yellow-fronted Amazon (*Chrysotis ochrocephala*).

The prevailing colour of this bird, as usual, is grass-green, with more or less defined dusky hind margins to the feathers; lighter and more glistening below than above and more golden, with dark shaft-streaks on the flanks and under tail-coverts; a large yellow frontal patch which in its centre extends backwards to the middle of the crown, in some examples (probably males) the yellow covers the crown, always, however, leaving a broad green interval above the eye; bend of wing and wing-speculum crimson; in the open wing the base of the outer web of fourth secondary is seen to be broadly purplish crimson; primaries blue black, all but the first, with their outer webs green towards the base; secondaries blue-black toward the tips, becoming bright blue on the outer webs; tail with golden green terminal belt narrowest on the central feathers, all the lateral feathers with a large rose-red spot towards the base of their inner webs, and a green band across the middle; upper mandible fleshy horn colour, blackish towards the tip, the cere blackish beset with black bristles; lower mandible blackish horn-grey; feet ashy-grey, with whitish powdering; claws horn-whitish; iris, orange to pale amber.

The females differ in having the yellow on the crown restricted if not absent, and the iris pale. The beak is narrower from before to beyond the middle when viewed from above. Hab., "Venezuela and Trinidad, Colombia, Ecuador, and Eastern Peru" (*Salvadori*).

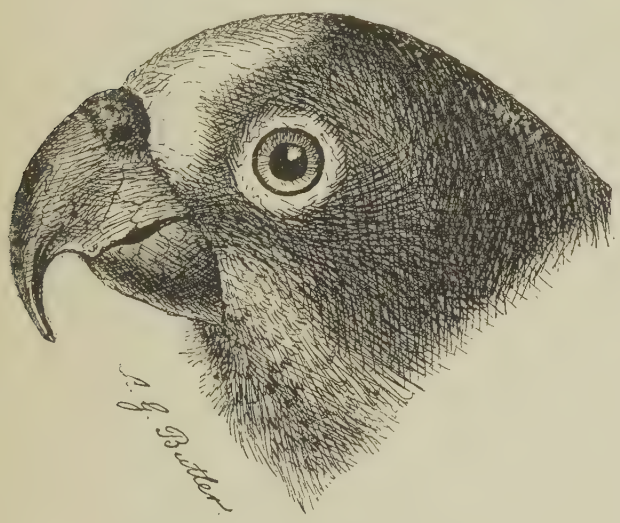
The only note I have found respecting the wild life is that quoted under *C. amazonica*; it is freely imported, and, according to Russ, the Indians regard it as the most highly intelligent species; he says that it is "prized as a capable talker; Surinams learn to speak superlatively well, also to laugh, cry, sing, and whistle beautifully; most of them are middling good birds, only a few are slightly or not at all gifted."

About the year 1893 an aunt of mine gave me a female example of this species which had been in her possession about twenty years, and had been in captivity in the possession of at least two owners for many years previously.

Although an undoubted female, this bird had entirely forgotten its own language, and expressed all its

emotions of rage, pleasure, fear, etc., precisely in the same manner as a child would. When startled or angry it would shout at the top of its voice exactly like a boy in a passion, filling up the intervals between the shouts with heart-rending sobs; sometimes it would call in a loud voice (which could be heard half-way down the road) for Lala, but Lala never came to help it. On enquiry I discovered that Lala was the Parrot's rendering for Nana, an ayah who at one time had stayed with a child at my aunt's house.

Although our Amazon said many things very distinctly, and evidently, in many cases, understood the meaning of what it was saying to some extent, it also talked a lot of utterly unintelligible twaddle to itself, apparently asking itself a series of nonsensical questions, to each of which it answered with a grave decided swing of its head—"No!" One funny little series of questions often took place when one first came down in the morning: The bird would stretch out its neck, look



YELLOW-FRONTED AMAZON (*Female*).

fixedly at you, and ask—"Quite well?" "Better, thanks Polly." "O! much better?" "Yes, much better." "Quite better?" "Yes, quite better." "Quite right," and with a swing of its neck the bird turned round and began to strut backwards and forwards. Another favourite series of sentences was gone through whenever anyone came into the room dressed for a walk: "Are you going out?" "Are you going in the park." "There's a cat in the park!" "Good-bye."

This bird was my servant's pet. She carried it about on her shoulder, and I was often afraid it would peck her eyes out; it bit her once or twice, but when it died in February, 1898, she was almost inconsolable.

A good many specimens of this species have been exhibited at the London Zoological Gardens, the first received there being presented in 1868.

YELLOW-BILLED AMAZON (*Chrysotis panamensis*).

Very like the preceding species, but smaller, the vertex of the head tinged with glaucous-green; the yellow of the head confined to the front, where the glaucous-green is wanting; hairy feathers round nostrils partly golden; the thighs yellow; beak yellowish (whitish horn-grey according to Russ), lead-coloured at tip. Female probably with shorter and broader beak. Hab., Panama, Veragua, and Colombia.

I have obtained no information respecting the wild life. Russ states that it comes into the market associated with the preceding species and is usually not distinguished from it, doubtless it is equally gifted. He describes another (species?) under the name of Hagenbeck's Amazon (*Psittacus hagenbecki*), which has been ignored by systematists; it is said to differ from *C. ochrocephalus* in its white beak with blackish tip, the almost entire absence of red from the edge of the wing and the tail, as well as the different marking of the latter (each feather with a weak reddish spot); from *C. panamensis* by its clearer green under surface, the lack of the blue-green spot on the abdomen, yellow thighs and superior size Hab., Unknown. If these birds come home together from Colombia, where both occur, is it not probable that they may interbreed there and produce inter-grades in size and coloration? The Zoological Society of London has, at various times, owned a fair number of this species; it would be interesting to know whether all have been perfectly typical.

GOLDEN-NAPED AMAZON (*Chrysotis auripalliata*).

The adult male is grass-green, rather paler below than above; the nape and often part of the crown yellow; edge and bend of wing with a few red feathers; wing speculum red; primaries black, all excepting the first with the base of their outer webs green; tips of both primaries and secondaries shot with blue; tail with a yellowish terminal belt; lateral feathers with the inner webs red at base; outer feathers edged with blue at base of outer web; beak pale horn-grey, yellowish at base of upper mandible; cere black; feet dusky; iris orange-red to hazel. Female with narrower beak, less bell-shaped when viewed from above, more arched, and with shorter terminal hook. Hab., Western Central Ameriaa from Guatemala to Costa Rica and Tigre and Ruatan Islands.

Mr. C. F. Underwood, writing on the Birds of the Volcano of Miravalles (*The Ibis*, 1896, pp. 445, 446) says:—"Very rare so high up; in fact, I only remember seeing some three or four pairs flying over the whole time I was there. But, on the other hand, in Bagaces these Parrots are extremely abundant, and regularly make the town their headquarters; in fact, the traveller arriving there a little before sunset is often deafened by their noise, and on his first visit is amazed at the strange scene. From all sides arrive innumerable bands and solitary pairs of "Loros" (the Spanish name), which remain for about an hour squabbling and fighting, constantly changing their perches before going to roost in the low trees in the immediate vicinity of the houses. "Supas" (Macaws) also make the town their roosting quarters. At daybreak there is a repetition of the noise; they then go off to their various feeding-grounds.

"The natives here appreciate a good talking Loro as a pet as much as Europeans do. The young are eagerly sought after, and the birds, when they begin to talk—which is generally at about a year old—sell for fairly good prices. This species seems to be by far the most easily taught."

According to the Hon. and Rev. Canon F. G. Dutton, this bird is a marvellous talker, and he recommends it very highly as a pet. It is a general favourite, but

unhappily is high-priced, and like all its relatives it knows how to scream.

Russ says that this species is somewhat rarer than its allies, yet generally known. He mentions the German prices as 50-75 marks for freshly imported birds; 100-150 marks for talkers. The London Zoological Society first purchased it in 1844, and has added others from time to time; the latest mentioned in the ninth edition of the "List of Animals" was deposited at the Gardens in 1893.

Double-fronted or Levaillant's Amazon (*Chrysotis levaillanti*).

The adult male above is green, more yellow on the upper tail-coverts; the head and neck yellow, pale round base of beak; the under surface paler and more bluish; bend of wing and speculum red; bastard wing and primary coverts slightly bluish; primaries black, all excepting the first with green bases to their outer webs; secondaries tipped with blue-black; tail with a broad yellowish belt towards the tip; the lateral feathers red at the base; the outer feather with blue outer web; tail below red at the base, green in the middle, yellowish at the tip; beak whitish; feet pale brown; iris red, with yellow inner ring. Female smaller; her beak slightly shorter and a trifle broader at the base when viewed from above. Hab., "Mexico, from Nuevo Leon on the east and Mazatlan and Tres Marias on the west to Tehuantepec, Yucatan, and Honduras." (Salvadori.)

I have found no notes respecting the wild life; but Russ says:

"Just as with us, it is treasured in its own home. The Indians steal the young out of the nests, and all large Yellowheads (German trivial name) reach the market already at least half-tame and speaking some words, yet always singly or in a few heads. Being delicate immediately after their importation, they then require considerable attention, but when well acclimatised, they belong to the longest-lived of all Parrots. Marvellous excellence! Astonishing gift of comprehension! Certain birds of this species, nevertheless, learn nothing. However, one should not conclude that such a one is beyond hope, for often, even after years, it learns quite admirably. Even the most excellent of such talkers, nevertheless, at times utters the most distracting natural scream."

The Hon. and Rev. F. G. Dutton speaks very highly of this Parrot, of which he says he once had one which sang seven songs, did the French military exercises, said other things, and swore like a sailor, and did it all when he told it. The bird must have been useful when anything unpleasant occurred which required the services of a layman.

The London Zoological Society first secured this Amazon in 1859, and has since exhibited a good many examples of it at the Gardens.

Natterer's Amazon (*Chrysotis nattereri*).

Green; bend of wing and speculum red; tail, excepting the two central feathers, with a greenish-yellow terminal belt; forehead, sides of head and throat, blue or bluish-green; naked orbital-skin white; beak horn-grey, blackish towards the tip, and with a yellowish spot on the sides of upper mandible towards the base; feet brownish-grey tinged with greenish; irides orange. Female not differentiated. Hab., "Rio Mamoré, W. Brazil, near Rio Madeira." (Salvadori.)

In his "Catalogue of the Parrots," Count Salvadori speaks of this species as not having been seen by him; neither is it mentioned in the ninth edition of the Zoological Society's "List of Animals," but Dr. Russ says ("Handbuch für Vogelliebhaber," p. 238): "Extremely rare and always only singly in the market." This is evidence that it has been imported into Germany.

Dufresne's Amazon (*Chrysotis dufresniana*).

Green; front edge of wing yellowish-green; first four secondaries orange at base, forming a speculum; primaries black, green at base of outer webs; innermost primaries and secondaries dark blue at tips; lateral tail-feathers with a broad yellowish-green terminal belt; the four outer feathers tinged with orange or reddish on inner webs of terminal portion; forehead and lores orange-yellow, crown yellowish; cheeks and throat bluish at tips of feathers; orbital ring white; beak dusky, "coral-red, yellow at base" (Russ); reddish-white at base of upper mandible; feet yellowish-grey, claws horn-grey; irides orange-red. Female smaller, and with distinctly shorter and broader beak. Hab., Guiana. I have found no notes on the natural life in my library.

The Hon. and Rev. Canon Dutton says of this species (Greene's "Parrots in Captivity," Vol. II., p. 97): "This is a handsome bird. He is about the size of the common Amazon. The prevailing colour is an even green, but the upper tail-coverts are brilliant crimson. He has a brownish line of feathers from eye to eye over the beak, which is dark horn-colour."

Salvadori says nothing about crimson upper tail-coverts or about the brownish feathers from eye to eye; his description of the beak also differs both from Canon Dutton's and Russ', since he says: "Bill dusky, with the base of the upper mandible red," and Russ says: "Bill clear to coral-red"; and later: "Base of beak and upper throat yellow." Greene figures the bird with a flesh-coloured beak, blue cheeks and chin, a scarlet cap, orange towards the edges, and the outer webs of the third to fifth secondaries wholly red. Doubtless this illustration is incorrect; but is the bird which Canon Dutton says is "not very attractive," and of which furthermore he remarks: "I have never seen a specimen that talked. They are rather quiet and dull," the same species as the true *C. dufresniana* described in the "Catalogue of Birds"? Greene's figure would do better for *C. rhodocorytha*.

C. dufresniana was first exhibited at Regent's Park in 1863, but several specimens of this, or the next species, have reached the Gardens since that date.

Red-topped Amazon (*Chrysotis rhodocorytha*).

Green; wings with a red speculum, otherwise as in the preceding species; tail also only differing in having a red patch towards the tip of the inner webs; crown or front of crown red, back of head and hind neck with brownish-red or maroon edges to the feathers; lores yellow; cheeks and throat tinged with blue at the tips of the feathers; upper mandible whitish, reddish towards the base; lower mandible horn-dusky; feet yellowish-grey; irides orange. Female smaller and duller in colour, but with longer, narrower, and less arched beak. Hab., "South-eastern Brazil, from Espiritu Santo to Serra dos Orgãos."

Burmeister says: "Inhabits especially the middle and northern Brazils (Rio de Janeiro, Spirito Santo), and there palpably the most beautiful species, but not abundant; lives in dense primeval forests and is recognisable by its weakly screaming hollow note, sounding like noat-noat."

This species was distinguished from Dufresne's Amazon by Count Salvadori (*The Ibis*, 1890, pp. 370, 371), which doubtless explains the confusion in the

LE VAILLANT'S OR DOUBLE-FRONTED AMAZON.

descriptions of that species which have arisen from confounding the two (both in Russ' and Greene's books). *C. rhodocorytha*, purchased in 1883, is recognised as distinct in the ninth edition of the Zoological Society's "List."

Green-cheeked Amazon (*Chrysotis viridigena*).

Above green, below brighter; feathers with black edges, most strongly marked on back of head and hind neck; front edge of wing pale-green; base of outer webs of first five secondaries crimson, forming a speculum; primaries black, all excepting the first, with green outer webs and bluish-black tips; secondaries with deep blue tips; tail green, the terminal half yellowish-green, this colouring more restricted on the two central feathers; crown and lores crimson, yellow at the base of the feathers; a deep blue band from above the eyes down the sides of the neck; cheeks and ear-coverts bright grass-green; beak yellowish-white, or whitish-yellowish-grey; feet yellowish horn-grey, sometimes bluish-grey; irides reddish-yellow to pale straw-yellow (the latter probably indicating the female colouring). Female with the red on the crown more restricted, her beak also slightly less heavy in character. Hab., Eastern Mexico.

I have found no account of the free life of this Amazon; it was originally entered in the Zoological Society's list as coming from Columbia (not "Colombia," as indicated in the catalogue of birds. The first example was purchased in 1863, and others have been secured from time to time, the last recorded in the ninth edition of the list having been purchased in 1892.

Finsch's Amazon (*Chrysotis finschi*).

Above deep grass-green, lighter and yellower below; the feathers with blackish or black edges; feathers of hind-neck faintly lilac-banded; front edge of wing pale green; primaries black, the outer webs green at base, deep blue at tips; first five secondaries red at base, forming a speculum; tips of secondaries deep blue; tail with a broad yellowish-green terminal belt, narrower on the two central feathers; outer feather edged with blue at base of outer web; frontal band extending to lores deep red; beak yellowish-white; feet pale grey, irides orange. Female smaller and rather duller in colouring than the male; the beak, seen from above, broader, shorter, and with coarser terminal hook. Hab., Western Mexico, from Sinaloa to Tehuantepec" (Salvadori).

In C. W. Beebe's "Two Bird-lovers in Mexico," pp. 182-183, we read:—"Several times during our stay we saw a beautiful sunset flight of Finsch Amazon Parrots. A flock of 200 or more, massed together as closely as possible, appeared high in air, alternately soaring and fluttering. Then the entire flock swung earthward in a magnificent loop, from wall to wall of the *barranca*, the delicate lavender edgings of the feathers showing plainly as they swept past with a loud whirr of wings, each little foot clinched tightly close to the tail-feathers. Upward they went again, swinging together with a grace and unison of which one never gets a hint from caged specimens."

This rare Amazon was first presented to the Zoological Society of London in 1874, and would seem not to have been received there since that date. Russ says of it "very rare," yet only puts the German price at from 30 to 60 marks, or, roughly speaking, £1 10s. to £3 per specimen.

Diademed Amazon (*Chrysotis diadémata*).

Green, slightly mealy, with somewhat dusky edges to the feathers, lilac-edged feathers on the hind neck; front edge of wing yellowish-green; primaries black, deep blue at tips, outer webs green at base; secondaries deep blue at tips, the bases of inner webs of first five secondaries red, forming a speculum; lateral tail-feathers with a broad yellow-green terminal belt; inner webs red at base, outer webs blue; forehead crimson shading into deep purplish-red on the lores; crown lilac; back of head greenish-yellow; chin vinous-red; under tail-coverts and smaller under wing-coverts yellowish-green; beak dusky, yellowish at base of upper mandible; feet greyish-black. Female probably with shorter beak than the male. Hab., Rio Solimoës, Amazons.

I have found no notes respecting the wild life. Salvadori says, "This bird seems extremely rare," and Russ says, "Rare in the trade"; but the price which he mentions (30 marks) hardly bears out that statement. The Zoological Society of London purchased a specimen in 1894.

Salvin's Amazon (*Chrysotis salvini*).

Green, slightly mealy, with somewhat dusky edges to the feathers; feathers of crown, back of head, and hind neck with lilac edges, the last mentioned narrowly edged with black; front edge of wing pale green; first primary black, the others also black, but deep blue at tips, and with the outer webs green at base; secondaries deep blue at tips, the first five with the inner webs red at base, forming a speculum; tail with a broad terminal yellowish-green belt, narrower on the two central feathers; lateral feathers red on inner webs, the outer one edged with blue at base of outer web; frontal band, extending to lores, crimson; under surface paler than above; under tail-coverts yellowish-green; beak dusky, whitish horn-colour at base of upper mandible; feet dusky; irides red. Female smaller and duller; her beak much shorter, slightly narrower, and more arched. Hab., "From Nicaragua, Costa Rica, Veragua, and Panama, in Central America, to Colombia, and also to Rio Negro, in the Amazon Valley" (Salvadori).

I have not come across any notes relating to the wild life. Though nearly related to the preceding species, Salvin's Amazon seems to be less rare. Russ does not mention it in his handbook, but it is quite likely that he may have confounded it with the Diademed Amazon; it stands under that name in the fifth to eighth editions of the Zoological Society's list of animals. The first specimen purchased for the Gardens was secured in 1871, and since then others have been exhibited there.

Yellow-cheeked Amazon (*Chrysotis autumnalis*).

Green; front edge of wing yellowish-green; primaries black, all excepting the first, with the base of the outer webs green, and the tips blue-black; secondaries with blue tips, and the usual scarlet speculum; tail with a broad terminal yellowish-green belt on the lateral feathers; the outer feather edged with blue on outer web; forehead and lores scarlet; feathers of crown, back of head, and nape lilac towards the tips, and edged with blackish; upper part of cheeks from beak to ear-coverts yellow, crimson at base of feathers; lesser under wing-coverts yellowish-green, the others and inner webs of flights grass-green; beak pale horn-colour, dusky at tip of upper mandible; feet pale greenish-ashy; irides orange-yellow. Female smaller than the male; the scarlet frontal band narrower, the

cheeks also showing less scarlet and more yellow; the beak much shorter and lighter, with shorter terminal hook. Hab., E. Mexico and Central America to Honduras and Ruatan Island.

Speaking of this species as occurring on Ruatan Island, Salvin says: "Not uncommon on the adjoining mainland" (*The Ibis*, 1889, p. 373). I have found no notes describing the wild life. The Zoological Society of London first acquired the species in 1869, and others have been added to the Regent's Park collection since that date, the last recorded in the ninth edition of the "List" having been deposited in 1895.

Yellow-bellied Amazon (*Chrysotis xanthops*).

Green, with darker edges to the feathers; primaries with bluish-green outer webs; lateral tail-feathers with the basal half orange-red, the terminal half greenish-yellow; outer feather with green outer web; forehead and crown to the middle yellow; cheeks and sides of head greenish-yellow; under surface paler green than above; a broad yellow abdominal belt; an orange-red spot on the sides; beak dusky yellow, whitish at tip. Female not differentiated. Hab., "Eastern and Central Brazil, from Minas Geraes to Cuyaba." (Salvadori.)

I have seen no notes on the wild life. Russ says ("Handbuch für Vogelliebhaber," p. 239): "There were two specimens in K. Hagenbeck's collection."

Red-tailed Amazon (*Chrysotis braziliensis*).

Green, with black edges to the feathers; front edge of wing rosy; upper wing-coverts and innermost secondaries with yellowish-green edges; primaries black, all excepting the first bluish on terminal half, green at base of outer webs; secondaries with blue tips; tail with a greenish-yellow terminal band, a subterminal carmine red band, and on the three outer feathers an inner purplish-blue band, the outer web of the outer feather more than half of the latter colour; front of head and lores rosy, top of head slightly yellowish; cheeks, ear-coverts, and chin purplish, bluer at tips of feathers; under surface paler green than above; under wing-coverts yellowish-green; flights below blackish, tinged with bluish or bluish-green towards base of inner webs; tail a little duller than above; beak pale horn-colour, dusky at tip of upper mandible; feet grey. Female smaller, less red on the head and the cheeks less purplish; beak broader at base, but narrower towards tip, and with more delicate terminal hook. Hab., Province of San Paulo, South Brazil.

Nothing seems to be published respecting the wild life of this Parrot. Two specimens reached the Zoological Gardens at Amsterdam in 1879, and others have since been received at the London Gardens, the last recorded in the ninth edition of the "List of Animals" having been purchased in 1885.

Bodinus' Amazon (*Chrysotis bodini*).

Green; front edge of wing yellowish; first primary and inner webs of the others black; lower back and rump red; tail with yellowish-green tip, the outer feather edged with bluish on outer web; a broad frontal band dull red; lores blackish; feathers of top and back of crown edged with dull lilac; feathers at back of head edged with black; superciliary band and chin pale blue; feathers of cheeks edged with purplish-blue; under surface yellowish-green; greater under wing-coverts and inner webs of flights verditer-green; beak and cere blackish; feet dark leaden grey; irides yellow encircled with red. Female apparently smaller, with less red on front of crown and less lilac on back of crown and nape, the beak rather shorter and narrower. Hab., Venezuela and British Guiana.

This rare relative of *C. festiva* has been represented both in the Amsterdam and London Zoological Gardens; Russ says that since 1879, when it was first received, there have been several in the market.

Festive Amazon (*Chrysotis festiva*).

Dark grass-green, the under surface being somewhat lighter, the under tail-coverts yellowish-green; the forehead and a bridle streak are blood-red; a broad curved streak above the eye and a stripe on the chin bright blue; primaries black, the outer webs dark blue on their basal half, coverts of the first primaries and angle of wing of the same colour; secondaries green on the outer webs, black on inner webs, tipped with blue, but the four last feathers uniformly green; under wing-coverts green, primaries below black, the inner feathers dark green on their basal half; tail feathers green, their inner webs greyish, hinder part of back and rump scarlet, the base of the feathers yellowish; bill yellowish horn-brown; feet horn-brown; iris of eye golden yellow. Female smaller, with shorter and fuller beak. Hab., Valley of the Amazons to Eastern Peru and perhaps Guiana.

According to Dr. Finsch this bird is somewhat rare, and, quoting Schomburgh, he says, "*Chrysotis festiva* is the most learned Parrot of America, as it not only speaks very plainly, but also learns to whistle entire melodies. It is, therefore, most highly prized by the Indians, and they require a much greater fee for it. In its manner of life it does not differ from its allies." Selby also says that "it is docile and easily trained, and, being of an imitative disposition, readily learns to pronounce words and sentences with great clearness and precision."

Dr. Russ says: "It does not count among the best speakers, and therefore is little admired. Rare in the trade."

The Hon. and Rev. F. G. Dutton is inclined to think well of this bird, although of the two which passed through his hands neither was tame or talked.

The general evidence tends to show that the Festive Amazon is hardly worth purchasing at the high price at which it is usually offered. It was first secured for the London Zoological Gardens in 1865, and several other examples have been received subsequently.

Red-fronted Amazon (*Chrysotis vittata*).

Green, with black edges to the feathers; bastard-wing, primary-coverts and outer webs of primaries blue; outermost secondaries blue; tail green with the terminal edge yellowish, as also the inner webs of the lateral feathers, which are, moreover, generally more or less red at base; outer feathers with blue outer webs; under surface paler green than above; a narrow red frontal band; beak yellowish; naked orbital skin whitish; feet brownish flesh-colour; irides yellow. Female probably with shorter and stouter beak. Hab., Porto Rico.

I have not come across any notes on the wild life. Russ says that it is "common, but little known," and he states the German price to be from 20-30 marks. It has been represented at the London Zoological Gardens since June, 1869, the last specimen recorded in the ninth edition of the "List of Animals" having been purchased in 1895.

PRÉTRE'S AMAZON (*Chrysotis pretrei*).

Green, with black edges to the feathers; bend and front edge of wing, bastard-wing, and primary-coverts red; some of the outermost greater upper wing-coverts red, or spotted with red; flights black, blue at tips and green at base of outer webs; central tail-feathers with pale tips, lateral feathers with the terminal half yellowish-green, the three outermost with small red marks on the inner webs between the basal green, and terminal yellowish areas; head, neck, and under surface brighter green than above, front of head, lores, orbital region, and thighs, red; inner webs of flights below green; under tail-coverts yellowish-green; beak yellow with the base of upper mandible suffused with orange-red; feet pale grey; irides yellow. Female probably with broader beak. Hab., "South-eastern Brazil and Rio de la Plata." (Salvadori.)

I have obtained no information respecting the wild life. The first example exhibited at Regent's Park was purchased in 1889, and the second in 1893. Russ says it was first imported in 1883 by Faulring, of Dresden, and then a single example was imported in 1885 by E. Klaus and W. Bandermann, of Hamburg. In 1887 Schaurte (a chef) exhibited one at the "Ornis" show at Berlin.

WHITE-BROWED AMAZON (*Chrysotis albifrons*).

Green; the feathers of neck and back with narrow dusky edges; upper tail-coverts yellowish-green; bastard wing and primary-coverts bright scarlet; primaries black, the outer webs blue at tip and green at base; secondaries with blue outer webs; tail green, with a yellowish-green terminal belt, increasing in width from the middle outwards, four outermost feathers red at base; forehead white, sometimes yellowish; top of crown blue; lores and orbital region red; greater under wing-coverts and inner webs of flights below verditor-green; beak pale yellow; cere and feet dull white; irides yellowish-white. Female with shorter beak, the terminal hook shorter and thicker. Hab., "Western Mexico from Sonora to Chiapas, Northern Yucatan, and Guatemala on both sides of the Cordilleras, Nicaragua, and Western Costa Rica." (Salvadori.)

Salvin says ("Proceedings of the Zoological Society," p. 455): "This bird abounds in every part of Yucatan, rarely entering the villages, though common near the ranchos, and frequently seen in the wild orange groves, where it spends much of its time eating the fruit of this tree. This bird is found domesticated in almost every house, and learns to speak quite readily."

Mr. C. Underwood, writing on the "Birds of the Volcano of Miravalles" (*The Ibis*, 1896, p. 455) says: "Plentiful, feeding on the fruit of the 'guagabo' (guava), an abundant tree in Miravalles, where it dots the pasture-grounds, and is preserved, as the cattle are very fond of the fruit."

According to Russ ("Handbuch," p. 241), "Described by Mrs. Arnold, of Munich, as lovable and clever, speaks much, but only certain words clearly; learns and forgets quickly."

The London Zoological Society purchased its first specimen of this Amazon in January, 1878, and the last recorded in the ninth edition of the "List of Animals" was deposited in July, 1895. This bird has sometimes been called "Spectacle Parrot," but why is not evident.

YELLOW-LORED AMAZON (*Chrysotis xantholora*).

Green, with black edges to the feathers; upper tail-coverts yellowish-green; tips and inner webs of feathers of the bastard-wing edged with blue; smaller anterior upper wing-coverts and primary-coverts scarlet; primaries black, the second to fifth with their outer webs blue towards the tips and green at the base; inner primaries and secondaries with the tips and outer webs deep blue; two central tail-feathers yellowish-green at the tips, lateral feathers yellowish-green with crimson base; front of crown white; top of crown blue; lores yellow; orbital region, except in front, and upper part of cheeks red; ear-coverts black; greater under wing-coverts and inner webs of flights below verditor-green; beak yellow; feet dull white. Female apparently with more blue on the crown, the forehead only being white, also with less crimson round the eye; the beak is less pointed towards the tip, and has a shorter terminal hook. Hab., "Yucatan, Cozumel Island, and British Honduras." (Salvadori.)

Mr. A. Boucard says ("Proceedings of the Zoological Society," 1883, p 455): "This bird seems to be very rare." He thinks the collector did not distinguish it from *C. albifrons*. On the other hand, in Cozumel Island, Mr. Salvin says (*The Ibis*, 1889, p. 374) many specimens, including both sexes and immature birds, were obtained. He adds: "This is apparently the only Parrot found on Cozumel Island."

I have found no field-notes dealing with this species. It was first secured by the London Zoological Society in 1875, a second specimen being purchased the year following; the last example, reported in the ninth edition of the "List of Animals," was added to the collection in 1886. Russ says it is very rare, yet fixes the price as from 20-30 marks.

SALLÉ'S AMAZON (*Chrysotis ventralis*).

Green, with black edges to the feathers; bastard-wing, primary-coverts and secondaries blue, with bluish-green outer edges; primaries black, all but the first with deep blue outer webs, paler edged towards the base; lateral tail-feathers with yellow inner webs and red bases, the outer feather with blue outer web; forehead, lores, and a line under the eyes, white; top of head and upper part of cheeks dull blue; a large black patch on the ear-coverts; middle of abdomen vinous-red; thighs bluish; greater under wing-coverts and inner webs of primaries below verditer-blue; beak and feet yellowish flesh-colour; irides reddish. Female apparently with smaller and rather narrower beak, with slightly shorter terminal hook. Hab., San Domingo.

Dr. C. Christy (*The Ibis*, 1897, p. 334) says that the local name of this bird is "Cotoro." He adds: "This Parrot is common in San Domingo. Round Sanchez it was to be met with at every turn, flying out of its nesting-hole in some old palm-tree or in small parties overhead, waking the echoes with their screeches.

"I can testify from personal experience that the flesh of this Parrot is very good eating, and it is much esteemed by the natives, whom I often met coming home with a string of half a dozen or more shot with their old muzzle-loaders.

"At times at Sanchez these birds afforded first-rate sport, for they flew with the greatest regularity from their breeding-haunts among the palm-trees in the swamp to the rice-fields and other feeding-grounds eastward, and back again in the evening, making all the way more noise than a flock of geese. When in returning they found a strong wind against them, they were obliged to fly directly over the town, and low down to get the shelter of the hills, so that one only had to take one's stand on the verandah, or behind a palm-tree, or, better still, between two houses, and shoot as they passed over. But shooting was extremely difficult, owing to the high wind, the speed at which the birds flew, and the suddenness with which they rose

to a higher level the instant they caught sight of a man."

Russ says that this bird is rare and little admired; he prices it at 18 to 20 marks. The first example exhibited at the Regent's Park Gardens was presented in 1862; a second was purchased in 1875, and others have since been acquired, the last recorded, in the ninth edition of the "List," in 1895.

White-fronted Amazon (*Chrysotis leucocephala*).

The adult male is green with black margins to the feathers; the crown, lores, and margin of eye white; top of crown tinged with rose-red; the cheeks and throat rose-red; ear-coverts black; bastard wing, primary coverts and outer webs of quills blue; tail with the inner webs of the lateral feathers red at the base and yellowish towards the tip, outer feather with blue outer web; abdomen dull red, with green edges to the feathers, greater under wing-coverts and inner webs of quills below blue; beak and cere whitish; feet flesh-coloured; iris brownish yellow.

The female, according to Russ, differs in having the red throat patch extended to the chest, and the lower breast purple violet; what I take to be the female is smaller, with the crown creamy-white without a trace of rose-red, the beak much smaller and weaker. Hab., Cuba.

Count Salvadori regarded the examples with rose-red on the front of the crown as varieties, but an examination of all the skins in the British Museum series convinced me that this character occurred in all the sexed males in the collection, so that I have little doubt that the absence of rose-colour from the sinciput is a characteristic feature of the female.

According to Gundlach, this Amazon is very destructive in gardens and orchards, and especially in the case of the cocoa palm, of which it devours the central shoot, and so naturally destroys the tree; it is therefore not surprising that, as Russ observes, this bird is hunted as game, and he adds: "Only young birds taken from the nests, hand reared, and tamed, are brought over amongst us. Not rare; in recent years, for instance, imported through Reiche and Ruhe of Alfeld; are also freely purchased in New York. In its native country is accounted clever and gifted with speech, and is so described by many aviculturists amongst ourselves. According to P. Hieronymus a male of this species went to nest at Karlsruhe in 1885 with a female of the Red-shouldered Amazon (Blue-fronted). From four eggs three young hatched, of which only one grew up. In the summer of 1885 that pair went to nest again, and Mr. Hieronymus got a female of a Noble Parrot (*Eclectus*) to incubate one egg and rear the young one."

The late Dr. Greene gives a long account of this species in his "Parrots in Captivity," Vol. III., pp. 101-106, with a few notes on its habits by the Hon. and Rev. Canon Dutton, who, in opposition to Bechstein, Creutz, etc., observes: "The small Amazons are not, according to my experience, good talkers; and the White-headed is not even good amongst the small Amazons."

The first two specimens to reach the London Zoological Gardens were received in exchange in 1868; ten years later a third was purchased, and since that date a good many others have been acquired. Russ prices this bird at from 20 to 30 marks for a specimen, but Canon Dutton says: "Unless the specimen be clever, £1 is ample at any time. They might be bought much cheaper."

Bahama Amazon (*Chrysotis bahamensis*).

Differs from *C. leucocephala* in its slightly larger size, brighter colouring, the abdomen usually entirely green, rarely showing a few scattered red feathers; the tail also showing red only on the two outer feathers. The female, so far as I could judge, seems to have a broader skull and shorter, broader beak than the male. Hab., Bahamas.

Under the name of *C. leucocephala*, Mr. J. L. Bonhote (*The Ibis*, 1903, p. 295) says of this species: "I brought home several specimens of this bird alive. They are now becoming very scarce, and are exterminated in most of their former haunts—viz., Abaco and Long Island. A few may possibly still be found on Inagua, but I only know of their existence positively on an island the name of which I think it inadvisable to divulge."

In *The Avicultural Magazine* for June, 1904, Mr. Bonhote gives an interesting account of the species under its proper name; the article is illustrated by an excellent coloured plate, which shows the tasteful colouring of this most beautiful of the Amazon Parrots to perfection.

Mr. Bonhote says: "The Bahama Amazon seems to have a great disinclination for flying, and even when in an aviary with full use of its wings it always prefers climbing."

While in the West Indies, Mr. Bonhote's birds had the run of the garden, and only came indoors at meal-time to receive their food—bread, potato, or banana. He says: "This was their only food, and on it they seemed to thrive. When spring came round, and the sapodillas began to open, they betook themselves to the sapodilla tree and wrought untold havoc amongst the fruit, throwing down what they had no use for." He adds: "They are very noisy, especially during the summer, sunrise and sunset being their most noisy periods, but unfortunately they are not over particular, and may be heard within a quarter of a mile radius during any of the hours of daylight."

I had the pleasure of seeing Mr. Bonhote's pair of this charming species in their English aviary, but was not close enough to be absolutely certain of their sexual characters. They nested in 1909, laid three eggs, and hatched one chick, but it unhappily died. I do not know of any other specimens having been imported.

Red-throated Amazon (*Chrysotis collaria*).

Green; the feathers on back of head and nape edged with black; feathers of the neck dull reddish with black edges and subterminal green band; bastard wing, primary coverts, and outer webs of flights blue, the secondaries with green edges; upper tail-coverts yellowish-green; tail with yellowish-green extremity, the lateral feathers red on the basal half and yellow on the terminal half of the inner web, outer feathers blue on the outer web; forehead white; top of head washed with blue; cheeks and throat dull reddish; a white line bordering the cheeks below the eyes; the upper part of cheeks washed with bluish-green and all the feathers with green edges; under tail-coverts yellowish-green; under wing-coverts and inner webs of flights below green; beak and cere whitish; feet flesh-coloured or ochraceous. Hab., Jamaica.

Gosse calls this the "Yellow-billed Parrot." Comparing it with *C. agilis* and another Parrot, he says ("Birds of Jamaica," p. 269): "The Yellow-bill is less common than either of the two preceding, but its habits are the same. The same fruits supply it with food, but, in addition, it divides the oranges to procure the

pips, and even cuts the acrid cashew-nut to extract the kernel, which the others will not do.

"The present and the preceding species build in holes in lofty trees; often a hollow bread-nut is chosen, and often the capacious and comfortable cavity chiselled out by the Woodpecker. Four eggs are usually laid; and when the green feathers begin to clothe the callow heads of the promising family, they are too often taken by some daring youth, who, having watched the parent to her hole, climbs the giddy elevation. He feeds the young with ripe plantain or banana, till they approach maturity, and their appetites can digest plainer food; for when grown they will eat almost anything."

Greene ("Parrots in Captivity," Vol. III., p. 95) calls this bird "Jamaica Parrot, or White-fronted Amazon," which looks as if he failed to distinguish it from *C. leucocephala*. This, however, is not the case, for he calls the latter "Cuban Parrot, or Red-throated White-headed Amazon," surely a most cumbrous name! I prefer to follow the London Zoological Society's list in these instances.

This Amazon, like its close allies, is not generally considered very gifted as a talker. Greene, who seems never to have kept the bird, says boldly that "it is best dieted on boiled maize and hempseed, with an occasional tit-bit in the shape of some ripe fruit, or a morsel of sweet cake or biscuit, but animal food should be strictly prohibited." I fancy that a diet consisting solely of two heating seeds and only fruit occasionally would speedily upset this or any Amazon.

The London Zoological Society acquired its first specimen of this bird in 1869, and two others reached the Gardens in 1873; others have been added subsequently.

Active Amazon (*Chrysotis agilis*).

Green; the top of the head darker and bluish; feathers of neck slightly edged with black; primary-coverts red; the primaries black, all excepting the first with the outer webs, especially at base, blue edged with green; secondaries blue, green at base of outer webs; tail with the inner webs of lateral feathers red, the outer webs of the outer feathers bluish; under-surface rather paler green than above, the under tail-coverts yellowish-green; greater under wing-coverts and part of inner webs of flights below verditer-green; beak greyish-black, with a pale spot at base of upper mandible; cere blackish-grey; feet greyish-black; irides dark brown. Female with a shorter and rather broader beak, with shorter terminal hook. Hab., Jamaica.

Gosse says ("Birds of Jamaica," pp. 266-268): "Flocks varying from half-a-dozen to twenty or thirty fly hither and thither over the forest, screeching as they go, and all alight together on some tree covered with berries. Here they feast, but with caution; on a slight alarm one screams, and the whole flock is on the wing, vociferous if not musical, and brilliant if not beautiful, particularly when the sun shines on their green backs and crimsoned wings. They generally prefer lofty trees, except when, in June, the ripe yellow plantain tempts them to descend, or when the black berry shines upon the pimento. Of the latter the flocks devour an immense quantity, and the former they destroy by cutting it to pieces with their powerful beaks, to get at the seeds.

"One day in January, when the pimento on the brow of Bluefields Mountain was about ready for picking, being full-sized, but yet green and hard, I observed large flocks of Black-bills and a few Parroquets flying to and fro with voluble chatter, now alighting to feed on the hot, aromatic berry, now flying off and wheeling round to the same neighbourhood again. They were not at all shy, but, with unusual carelessness of our proximity, scarcely moved at the report of the gun which brought their companions to the ground. Of two which I shot on this occasion I found the craws stuffed with the cotyledons of the seed alone, the most pungently aromatic part of the berry, the fleshy part having been, as I presume, shorn off by the beak and rejected. When alighted, as is often the case, on a dry branch, their emerald hue is conspicuous and affords a fair mark for the gunner; but in a tree of full foliage their colour proves an excellent concealment. They seem aware of this, and their sagacity prompts them frequently to rely on it for security. Often we hear their voices proceeding from a certain tree, or else have marked the descent of a flock upon it, but on proceeding to the spot, though the eye has not wandered from it, and we are therefore sure that they are there, we cannot discover an individual. We go close to the tree, but all is silent and still as death; we institute a careful survey of every part with the eye, to detect the slightest motion, or the form of a bird among the leaves, but in vain. We begin to think that they have stolen off unperceived, but on throwing a stone into the tree a dozen throats burst forth into cry, and as many green birds rush forth upon the wing."

The first specimen of this species exhibited at the Gardens in Regent's Park was purchased in 1873, and I am not aware that any other has been received since that date. Russ asserts that it has only been in evidence at the London Zoological Gardens.

Short-tailed Parrot (*Pachynus brachyurus*).

Green; upper tail-coverts yellowish-green; primaries and primary-coverts darker green; secondaries and greater wing-coverts with yellowish-green edges; a dark red patch on front edge of smaller wing-coverts; tail yellowish-green, greener on central feathers, a red band near base of lateral feathers; under-surface yellowish-green; under wing-coverts greener, excepting at the edges; greater coverts and flights below verditer-green; beak dusky horn-grey; feet brown; irides red ("pale yellow," Goodfellow). Female with longer and narrower beak, with more slender terminal hook; the naked orbital area sometimes (if not always) much darker than in the male. Hab., Upper Amazons and Ecuador.

Dr. Emil A. Goeldi, writing about a visit to South Guyana (*The Ibis*, 1897, p. 162), says: "The bird, however, which most interested me was the *Pachynus brachyurus*, a short-tailed and corpulent green Parrot, of which a flight of some twenty individuals perched (October 30) on a siriúba. Unfortunately I got one specimen only of this species, which is not found, as I know well, after nearly three years' residence, in the vicinity of Pará."

Mr. Walter Goodfellow (*The Ibis*, 1902, p. 219) says: "We only once came upon a large flock of these Parrots, when they were congregating at sunset in the high trees along the river banks for the night."

These are the only field notes that I have come across. The species is not mentioned in Russ' "Handbook." Two examples were purchased for the London Zoological Gardens in 1894.

The genus *Pionus* is characterised by its red under tail-coverts and complete orbital ring. The species should be treated in captivity in the same manner as the Amazons, to which they are very closely related. Up to the present time seven species appear to have been imported as cage-birds.

Red-vented Parrot (*Pionus menstruus*).

Green; upper wing-coverts with a golden brownish-olive sheen; outer web of first primary edged with greenish-blue; lateral tail-feathers with the outer webs blue towards the tips or wholly blue; head and neck blue; a black patch on the ear-coverts; a more or less concealed rosy red patch on the throat; feathers of upper breast more or less tinged with olivaceous-brown and edged with blue; under tail-coverts rose-red tipped with green more or less washed with blue; greater under wing-coverts and inner webs of flights below grass-green; beak blackish, with a red patch at base of upper mandible; cere greyish; feet grey; irides brown. Female with a smaller and narrower beak, with longer terminal hook. (Hab., "From Costa Rica to Colombia, Trinidad, Guiana, Amazon Valley, Ecuador, Peru," and perhaps Bolivia. (cf. Salvadori Cat.)

T. K. Salmon ("Proceedings of the Zoological Society," 1879, p. 538) says that this bird "builds in the holes of decayed palm trees, and lays four white eggs."

Burmeister ("Systematische Uebersicht," Vol. II., p. 190) states that this "bird is the commonest species among the short-tailed Parrots of medium size in the forest-region of the coasts, and is everywhere called Maitacca."

Schomburgh (Reise III., p. 723) met with it equally abundantly in Guiana, where it especially sought for the ripe guava-fruits.

Mr. Walter Goodfellow, writing on the birds of Colombia and Ecuador (*The Ibis*, 1902, p. 219), says that this species is "common on the Napo, but most plentiful on the lower parts."

The Hon. and Rev. Canon Dutton says of this Parrot (Greene's "Parrots in Captivity," Vol. III., p. 109):—"Mine took a strong dislike to one man, but the rest of the world could do what they pleased with it. It was very quiet, never screamed, but never learnt anything; it was a stupid bird."

Russ says:—"Known in the trade, but not commonly; easily tameable, that is if taken out of the nest when young; learns to speak single words. When adult a hateful screamer. Price 30-50 marks for a pair; tame and talking, 60-70 marks for a specimen."

The first two specimens exhibited at the London Zoological Society's Gardens were purchased in 1868, and a fair number has since been acquired.

Sordid Parrot (*Pionus sordidus*).

Above olive-green; first primary edged with blue on outer web; lateral tail-feathers with blue outer webs, red towards base of inner webs; feathers of head with dark blue edges, those of cheeks tipped with blue; chin and a band across the throat blue; breast and abdomen dull olivaceous; under tail-coverts red; greater under wing-coverts and inner webs of flights below malachite-green; tail below green, with the lateral feathers red at base; beak red, the base of culmen dusky and a yellowish tinge at base of upper mandible, near the tomium; feet dusky. Female probably smaller, with a rather broader beak. Hab., Venezuela.

I have found no notes on the wild life of this bird. Russ says of it—"Fairly quiet, is easily tamed, but when excited screams a good deal and by no means agreeably."

Two specimens were purchased by the London Zoological Society in 1873 and one in 1883.

Coral-billed Parrot (*Pionus corallinus*).

Dull green; feathers of interscapular region with dusky bluish edges and a greyish subterminal shade; lateral tail-feathers with blue outer webs, the inner webs red towards the base; feathers of head with bluish edges; chin, and a band across the upper breast, blue; under tail-coverts red, with dark shafts; greater under wing-coverts and inner webs of flights below malachite-green; beak coral-red; feet grey; irides brown. Female not differentiated. Hab., Ecuador and Colombia.

Walter Goodfellow (*The Ibis*, 1902, p. 219) says:—"A male from Guanacillo, Western Ecuador. Beak coral-red, white at the tip."

I have found no notes on the wild life in works in my library. Russ says:—"So far as I know, on one occasion, for the first time, offered for sale by Miss Hagenbeck."

Maximilian's Parrot (*Pionus maximiliani*).

Green; feathers of hind neck with whitish shaft-streaks; feathers of back, rump, and wing-coverts with dusky edges with olivaceous brown sheen; outer web of first primary edged with greenish-blue; lateral tail-feathers with the outer webs mostly blue and the inner webs more or less red; feathers of the head with dark grey edges; forehead and lores nearly black; feathers of cheeks with bluish-grey edges; chin and a band across lower throat dull purplish-blue; feathers of breast and abdomen with dusky edges; under tail-coverts red, sometimes washed with purple, the longest with narrow yellowish-green edges; greater under wing-coverts and inner webs of flights below grass-green; tail below with the base of the inner webs of the lateral feathers more or less red; beak horn-yellowish, dusky at base of upper mandible; feet dusky. Female with smaller and slightly stouter beak. Hab., South-eastern Brazil and Paraguay.

Mr. E. W. White, writing on the "Birds of the Argentine Republic" ("Proceedings of the Zoological Society," 1882, p. 622), says of this Parrot:—"Only one specimen seen, perching on one of the topmost branches of a high tree in the dense forest on the banks of the Vermejo."

That is the only field-note I have come across, and it tells us practically nothing respecting the wild life of the species."*

Russ says:—"Rare in the market. According to von Schlechtendal, at first distrustful, cry piercing, oon became tame."

First purchased by the Zoological Society in 1862; others have been acquired more recently.

White-headed Parrot (*Pionus senilis*)

Olive-green; lesser and median upper wing-coverts olive-brown with a golden sheen; front edge of wing white; bastard-wing, primary-coverts, and primaries deep blue, edged with green on outer webs; central tail-feathers blue towards tips, lateral feathers blue, red at base of inner webs; the inner ones green towards base of outer webs; crown white; rest of head green, with blue edges to the feathers; a white patch on chin and middle of throat; breast olive-brown, with purplish-blue edges to the feathers, becoming greener towards the abdomen; under tail-coverts red, bluish towards tips and with green shafts, the longer ones with yellowish-green edges; under wing-coverts green, washed with blue towards tips, the greater ones and

* A field-note by Schomburgh is believed not to refer to this species. (See "Foreign Bird-Keeping," Part II., p. 53).

inner webs of flights below grass-green; tail below bluish green towards terminal extremity, red towards base; beak pale horn-yellow; feet pale brown; irides brown. Female slightly smaller, with smaller, shorter, and more arched beak, with shorter terminal hook. Hab., "Southern Mexico and Central America, as far as Costa Rica." (Salvadori.)

I have found no field-notes relating to this species. Russ says it is rare, the price for single examples being 20 to 30 marks in the German market. It first arrived at the London Zoological Gardens in 1862, and a second example was purchased five years later.

Bronze-winged Parrot (*Pionus chalcopterus*).

Blackish-blue; back and scapulars dark green, brownish in the middle and indistinctly edged with blue; lower back and rump deep blue; upper tail-coverts brownish-green edged with blue; upper wing-coverts copper-brown; outermost greater coverts blue edged with brown; bastard wing, primary coverts, and flights purplish-blue; inner secondaries edged with brown; tail blue; head and neck dark green, with dark blue edges to the feathers; under surface blue, dark green at base of feathers; feathers of chin edged with white, those of throat edged with pale red; under tail-coverts vermilion, bluish along the shafts; lesser and median under wing-coverts blue; greater coverts and inner portion of inner webs of flights below verditer-blue; tail below either verditer-blue or reddish towards base of inner webs of feathers; beak horn-yellowish-white; feet and naked orbital skin reddish flesh-colour; irides brown. Female, when fully adult, with much broader beak and much shorter terminal hook. Hab., Colombia and Eastern Ecuador.

Mr. Walter Goodfellow obtained two pairs of this species at Santa Domingo. He says (*The Ibis*, 1902, p. 220): "Not common there, and met with in pairs. Bill yellow-horn-coloured. Bare skin round the eyes red."

I have found no notes on the habits of the species when at liberty. Russ does not mention the species in his Handbook. The London Zoological Society purchased a pair in June, 1883.

Dusky Parrot (*Pionus fuscus*).

Above dark brown, the edges of the feathers paler; bastard wing, primary coverts, and flights purplish-blue; tail purplish-blue, with the inner webs of the lateral feathers red excepting at the tips; head dark blue; lores with a red tinge; ear-coverts black; a whitish collar on throat and sides of neck; feathers of chin with reddish edges; under surface brown, the feathers with purplish-red edges; under tail-coverts purplish-red; lesser and median under wing-coverts purplish-blue; greater under-coverts bright purplish-blue; flights below black, their inner webs internally bright purplish-blue; beak greyish-black, yellowish towards base of upper mandible; feet greyish-black; irides brownish-black. Female smaller, with smaller and broader beak, with shorter terminal hook. Hab., "Guiana and Lower Amazons as far up as Rio Negro and Borba" (Salvadori).

Burmeister never met with this species, and therefore gives no account of its wild life; nor have I come across any notes relating to it. Russ speaks of it as "Very rare" and mentions no price. It reached the London Zoological Gardens in 1869 and 1875, and in 1884 a specimen was acquired by exchange.

Of the Caiques, which have to be considered next, I have had no personal experience; but, judging from the writings of those who have kept them, I should suggest canary, oats and hemp, with plenty of ripe fruit and plain biscuit occasionally, as most suitable food for them in captivity; at the same time it is quite likely that they might do well upon the same food as the Amazons, from which they differ chiefly in details of plumage. *Deroptyus* is characterised by its rather long tail, rather short beak, and broad, long, erectile feathers on the hind neck, but some of the true Amazons can partly erect the feathers of the hind neck and length of beak is a very variable character as well as usually a sexual one.

Hawk-headed Caique (*Deroptyus accipitrinus*).

The prevailing colour of the upper parts in the adult male is deep grass-green; the head is brown, with the forehead and lores darker, the crest grey, and the sides of the head with greyish shaft-streaks; the ruff or long feathers of the nape, the breast, and abdomen deep red, each feather bordered with blue; the bastard wing, the primaries and their coverts black; the secondaries green, with blue-black tips; tail feathers green, with the tips increasingly blue from the middle outwards; wings and tail below mostly black, but the lateral tail feathers spotted with red at the base of the inner webs; beak chiefly blackish; feet blackish; iris brown to dazzling yellow, the difference being possibly sexual. Female probably without red spots on the lateral tail feathers, undoubtedly smaller than the male, and with a lighter construction of beak. Hab., Guiana, Amazons to Ecuador and Maranham (N.E. Brazil).

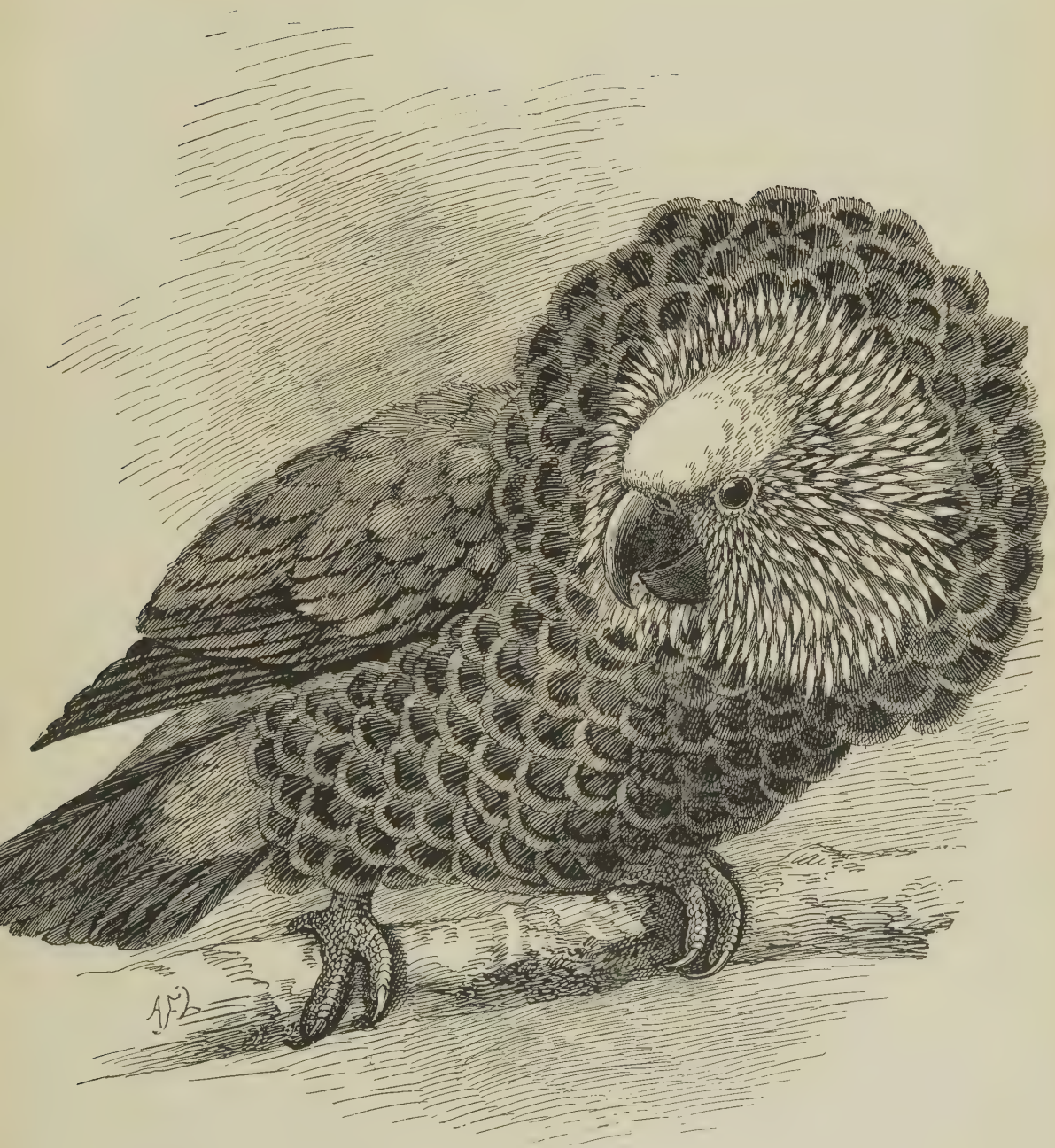
Salvadori speaks of the beak as dusky horn colour, and Burmeister calls it brownish-horn-grey with paler tip, but I have followed Russ. According to Schomburgk it is less abundant than the typical Parrots. It lives chiefly in pairs, more rarely in little companies, affects the lower woods in the vicinity of settlements, is confiding, easily tamable, but delicate and unteachable. Its cry sounds like hia-hia (the English equivalent would be hea-hea); it, moreover, nests in tree-holes, and lays more than two eggs, occasionally four. When excited it erects its beautiful nape feathers in a broad half-circle.

Dr. Russ regarded this as far and away one of the most beautiful and interesting of Parrots, but he noted it as rarely and only singly imported. His verdict does not quite correspond with that of Schomburgk: "Vigorous and long-lived, easily tamed, subsequently lovable and confiding, wise and intelligent, quiet, peaceable, gentle, and thoughtful; whistles loudly and not unpleasantly; learns to repeat certain words; screams at times, for the most part only for pleasure, piercingly and shrilly, then expands its collar; it, however, settles down quietly at once when spoken to."

The late Dr. Greene, in his "Parrots in Captivity," gives a long account of two specimens which had been in his possession. One of them he considered almost as talented as a Grey Parrot.

The Hon. and Rev. F. G. Dutton considers the bird somewhat treacherous and inclined to bite. In captivity it may have hemp, oats, dari, canary, plain biscuit and fruit.

The Zoological Society of London has, at various times, possessed a good many examples of this bird. Their first specimen was presented in 1856, and the last recorded in the ninth edition of the "List" was deposited in 1894.



Hawk-headed Parrot.

VIOLET-BELLIED PARROT (*Triclaria cyanogaster*).

Green; outer webs of first four or five primaries more or less blue; tail tipped with blue, the outer feather also tinged with blue on outer web; chin and thighs slightly bluish; middle of lower breast and of abdomen rich violet, with a reddish suffusion; greater under wing-coverts and inner webs of primaries below verditer-blue; tail below also verditer-blue; beak horn-white; feet brownish; irides rich chestnut. Female smaller, the body below entirely green, without the violet patch; the tail below greener. Hab., South-eastern Brazil.

Burmeister gives us no account of the wild life of this species, although he says he received several examples both in New Freiburg and in Lagoa Santa. It would seem that he did not himself secure them, for he says: "To me it was called by the shooters *Maitacca;* the Prince and Spix call it *Sabiah-si* or *Sabiah-sica*, which means Green throat" (or Thrush).

In *Canary and Cage-Bird Life* for July 24th, 1908, the Rev. H. D. Astley published an account of a specimen of this bird in his possession. He there says:—

"My bird is extremely gentle, and a curious mixture of timidity and confidence. If I put my hand into the cage he does not altogether approve, but when I remove it he commences his curious call notes, and seems to be telling one that he did not really mind, and was only in play!

"He has a most uncommon voice, unlike any other of the Parrot tribe that I have ever heard, a kind of shrill, yet not unmelodious, crowing.

"Intelligent? Well, yes, decidedly, in his own way. He cannot speak, and he will sit quite still for a long time in meditative moods, but he knows what's what, and is, I am sure, a beggar to think!

"He won the first prize in his class at the Crystal Palace Show this year, and in my humble opinion, as well as in that of others, he deserved the special prize for the rarest bird in the exhibition, for he was also in perfect condition and health, and I doubt if many, if any, aviculturists knew what he was at first sight, which one could not say of any of the other foreigners, and that is a fairly good test of rarity. Mr. Seth-Smith saw him last summer, and could not at all say what he was, or from whence he came.

"This bird is quite well and happy on canary seed, a little fruit, and green food; and he loves his bath. Had I more time and fewer birds, I believe I could make him finger-tame.

"He did not arrive in England, but was 'made in Germany,' at any rate he put in his appearance in the Hamburg docks, and was recommended to me by that great and courteous dealer in all that is wonderful, Herr Carl Hagenbeck. That was two years ago, and the little Parrot shows every sign of going happily on for some time yet.

"Let us hope so!"

RED-CAPPED PARROT (*Pionopsittacus pileatus.*)

Green; bend to front edge of wing, bastard-wing, primary-coverts, and flights deep blue; outermost primaries (excepting the first) and secondaries with green edges to outer webs; tail deep blue, the central ones green, excepting along the middle and at the tips, the other feathers with green outer edges; crown, lores, and a narrow band below the eyes to the upper ear-coverts, red; abdomen and under tail-coverts tinged with yellowish; under wing-coverts bluish-green, the greater ones and inner webs of flights below verditer-blue; tail below verditer-green, bluer towards tips of feathers; beak bluish-grey, whitish at tip; feet blackish-grey; irides brownish-grey. Female with a blue wash on the forehead, the crown olivaceous-green; no red on the head, excepting a small longitudinal dash across the forehead; beak rather smaller and broader. Hab., South-Eastern Brazil and Paraguay.

Burmeister says ("Systematische Uebersicht" II., p. 195):—"This beautiful Parrot is not rare in the forest region of the coast of Brazil from Rio de Janeiro to Bahia. It lives less socially than the succeeding smaller species, and first assembles in great flocks in the cold time of the year (May to September). In its manner of life it does not differ from the general habit of the Parrots."

Herr H. von Ihering, in his "Ornithological Notes" from South Brazil (*The Ibis*, 1901, p. 14), says of the nest of this Parrot: "This nest was also in the hollow of a tree with the aperture far above. The eggs are of rounded form, not polished, measuring 26 by 22—22.5 mm."

This Parrot was first exhibited in the London Zoological Society's Gardens at Regent's Park in 1877. A second specimen was purchased in 1883, and a pair about 1894 or 1895. Russ says ("Handbuch," p. 229):—"Beloved, because beautiful, pleasing, gentle, and peaceable, vigorous, and enduring. Unhappily rare and generally imported singly. In the birdroom it always roosts on the highest branches, yet is not a little fool; does not scream unpleasantly, its cry is only sharp and penetrating when one is close to it. Male and female prattle in a pleasant twittering, like the Singing and Undulated Parrakeets; soon tame and confiding. Price 20 to 30 marks for the pair."

About 1904 Mr. F. C. Thorpe, of Hull, imported a few specimens, and in October of that year a male was exhibited at the Crystal Palace. In *The Avicultural Magazine*, Second Series, Vol. III., pp. 351, 352, the Rev. Hubert D. Astley published a short account of a male in his possession, the article being illustrated by a beautiful coloured plate, by Goodchild.

BLACK-HEADED CAIQUE (*Caica melanocephala*).

Above green; an orange-reddish collar, edged above and below by some bluish feathers, on the hind-neck; front edge of wing partly yellow; primary-coverts and primaries black, with deep blue outer webs, edged with green; tail edged with yellow at tip; crown black; cheeks and throat yellow; breast and abdomen whitish-cream colour; sides of breast, axillaries, flanks, and thighs orange-yellow; under tail-coverts yellower; greater under wing-coverts and flights below black; tail below brown, with a golden sheen; beak horn-black; feet and orbital skin-black; irides brown internally with an outer ring of red. Female with the beak narrower, and rather longer than that of the male when viewed from above. Hab., Guiana and Upper Amazons to the Rio Negro, and perhaps Bogota.

According to C. A. Lloyd ("Timehri," New Series, Vol. IX., p. 270) this species "nests in holes high up in the trunks of trees."

The London Zoological Society purchased this species in 1855, and since that date has owned a good many specimens, the last two recorded in the ninth edition of the list being deposited in 1893. Yet Russ ("Handbuch," p. 232) says it is "Very rare. A male in the possession of Mr. E. von Schlechtendal played comically, at the same time uttering a screeching whistle; it was bold, but unfriendly."

White-bellied Caique (*Caica leucogaster*).

Above green; wings as in the preceding species; crown, hind-neck, and upper ear-coverts orange-reddish; lores, sides of head, and throat yellow; breast and abdomen whitish-cream colour; axillaries orange-reddish; flanks and thighs green; under tail-coverts yellow; tail below dull-golden; beak white; feet pale brown; naked orbital skin reddish flesh-colour; irides reddish-brown. Female probably differs as in the preceding species. Hab., Lower Amazons.

I have come across no field-notes relating to this species. The London Zoological Society purchased a specimen in 1880, and a second in 1883. Russ says it exists only in the London and Amsterdam Gardens.

Yellow-thighed Caique (*Caica xanthomera.*)

Differs from the preceding species in having the flanks and thighs lemon-yellow instead of green. Hab., Upper Amazons.

I have discovered no notes on the wild life of this Parrot. Two specimens were purchased for the London Zoological Gardens in 1877.

As in my little work "How to Sex Cage-Birds," p. 125, I shall commence the next chapter with the African forms of the present sub-family, followed by the *Psittacinæ*. The species of Africa have been more studied in their wild state than those of Central and Southern America, and consequently the account of the species is likely to occupy more space than those considered in the present chapter.

CHAPTER XII.

AFRICAN PIONINÆ & PSITTACINÆ.

Typical Parrots.

The species of *Pœocephalus* to which all the African *Pioninæ* belong are characterised by having the second and third primaries the longest, and the first equal to the fourth. In captivity they may be treated in the same manner as the Grey Parrot and its allies.

Levaillant's Parrot (*Pœocephalus robustus*).

Above, interscapular region, scapulars, and wing-coverts black, each feather marked with green on the edge; bend of wing and front edge vermilion; lower back and rump, bright grass-green; flights and tail-feathers dark brown; head and neck olive with brown centres to the feathers; lower part of cheeks and chin browner; breast,* abdomen, and under tail-coverts bright grass-green; thighs vermilion; beak whitish horn-colour, or greyish-white; feet bluish-grey; irides dark brown. Female with a slightly broader and much shorter beak. Hab., South Africa to Zambesi on the east and Angola on the west.

In Sharpe and Layard's "Birds of South Africa," p. 194, we read: "Le Vaillant states that they breed in hollow trees, and lay four white eggs, about the size of those of pigeons'. According to Dr. Kirk the food consists of wild fruit and the kernels of nuts."

In Stark and Sclater's "Birds of South Africa," Vol. III., p. 225, we get a much fuller account, as follows:—"Levaillant, whose name it bears, first accurately described this Parrot; he gives a long account of it as observed by him in the eastern portion of Cape Colony, stating that its habits are extremely regular.*

"In the early morning they are to be found in considerable flocks on certain dead bare trees sunning themselves and drying their damp plumage. From about ten to eleven in the morning they disperse to feed, chiefly on the nuts and seeds of the Geelhout (*Podocarpus*), and the Wilde Kersen (*Pterocelastrus ?*). During the heat of the day they rest in the recesses of the forest. In the afternoon they again feed, and later on resort in large companies to special watering-places to bathe and drink; an evening toilette is performed on the bare dead trees, and finally they disperse to roost at night. They nest in holes in trees, and lay four round white eggs about at large as those of a domestic pigeon, and both male and female assist in the incubation."

"The best modern account of these birds is that of the Woodwards, who state as follows: 'These Parrots, like the rest of their tribe, are gregarious, and congregate in large numbers in the upper districts of Natal, seldom visiting the coast. They frequent the highest trees, sitting quietly during the day, but as evening draws on they fly out in search of food, making the woods resound with their shrill cries. Owing to their wild nature they are rather difficult to approach, and the only specimens we obtained were on the Upper Umzimkulu.'"

Mr. G. C. Shortridge says (*The Ibis*, 1904, pp. 197 and 198): "This is a plentiful bird. It flies high and rather swiftly when travelling, but is easily distinguished from other birds by its quickly flapping wings and continuous screaming."

This bird was first exhibited in the Regent's Park Gardens in 1853, and several others have been received since that date. Russ says it is very rare in the market; a tame male, talking and whistling, was offered for sale by Dieckmann, of Altona, in 1883, and later a pair, the female of which laid three eggs.

Brown-necked Parrot (*Pœocephalus fuscicollis*).

Above, interscapular region, scapulars, and wing-coverts greenish-brown, greener at edges of the feathers; lower back, rump, and upper tail-coverts bright grass-green; bend and front edge of wing vermilion; flights and tail dark brown; head and neck silvery-grey, with brown centres to the feathers; lower part of cheeks and chin browner; forehead and sometimes top of head, rose-red; lores blackish; upper breast greenish-grey; lower breast, abdomen, and under tail-coverts bright grass-green; thighs vermilion; beak whitish; feet lead-colour; irides maroon. Female probably with shorter beak and a shorter terminal hook. Young without red on bend and front of wing; thighs mixed green and red. Hab., "Western South Africa, from Gaboon to Angola, Damaraland, and across Africa to the Zambesi region." (Salvadori.)

In Stark and Sclater's "Birds of South Africa," we read: "Mr. Andersson states that this Parrot is very wild and difficult to approach, and that it is only in the dry season in early morning and late evening, when they come down to the water, that they can be procured."

Russ says that this bird is very rare. Two specimens were purchased for the London Zoological Gardens in 1869.

* Russ says the breast is bluish-grey; possibly he may have described from an abraded specimen.

* A statement confirmed by C. F. M. Swynnerton (*The Ibis* 1907, pp. 296, 297).

JARDINE'S PARROT (*Pœocephalus gulielmi*).

The prevailing colour of this bird is grass-green, the forehead, bend and front margin of wing, and thighs varying from yellowish-orange to red; lores blackish; back and shoulders brownish-black, each feather with a dark green border; rump yellowish-green; sides of abdomen and lower tail-coverts with olive-yellowish centres to the feathers; beak greenish-black, the base, cere, and naked space encircling the eye flesh coloured; feet greyish-black; iris pale brown.

The female is rather smaller than the male, and has a lighter and less powerful beak. In the young the forehead, bend and front margin of wing, and the thighs are green, but the axillaries and under wing-coverts are partly red. Hab., "Western Africa from the Gold Coast to the Congo." (Salvadori.)

Respecting a form of this species occurring in Cameroon, Mr. G. L. Bates says (*The Ibis*, 1904, p. 91): "The green Parrots (*Pœocephalus aubryanus*) were shot in a tree, where they were feeding. These birds have so little fear that they will return to the same tree again and again, till all the flock is killed. They are seen here only occasionally." In *The Ibis* for 1907, p. 428, he says: "Heard in the Zima Country. The species is known by its shriller scream." I have not discovered any other field-notes relating to this species.

It is not a particularly rare bird in the European markets, but acclimatised specimens, and especially talkers, fetch a tolerably high price.

As regards its capacity for learning, individuals vary greatly. Dr. Russ, from his experience of the species, describes it as "very quiet, and exhibiting little activity; only when terrified and anxious uttering a shrill cry. A little gifted with speech." In opposition to this verdict, it will be remembered that in *The Feathered World* for June 30, 1899, J. McMillan published a very entertaining account of a specimen in his possession which (without any systematic training) had picked up numerous sentences, called the children by their Christian names, laughed, cried, whistled, and imitated the milkman's call.

The first specimen of Jardine's Parrot exhibited in the Regent's Park Gardens was deposited in 1862; others have, from time to time, been on view there since that date.

BROWN-HEADED PARROT (*Pœocephalus fuscicapillus*).

Green; lower back, rump and upper tail-coverts, brighter; flights brown, edged with green on outer webs, tail-feathers olive-brown, tipped, and edged on outer webs, with green; head and neck olivaceous greyish-brown; ear-coverts silvery-grey; breast, abdomen, and under tail-coverts paler and brighter green than upper back; under wing-coverts yellow; upper mandible horn-colour, lower mandible white; feet black; irides yellow. Female smaller. Hab., "Zanzibar and South-eastern Africa, from Mombas to Swaziland." (Salvadori.)

In Sharpe and Layard's "Birds of South Africa," p. 197, we read:—"This seems to be, as Dr. Kirk remarks, the most common of the Parrot tribe in Eastern Tropical Africa, and it has been found at various places from Uzaramo southwards to the Zambesi region; here Dr. Kirk says it is called "Goe," and he states that it is "usually found in small flocks or in pairs; feeds on fruits, such as figs, etc., but also eats native millet and maize. Its clear scream may be heard at a great distance."

Mr. Frank Finn, writing on East African birds (*The Ibis*, 1893, p. 229), says: "I met with this bird on a few occasions in captivity at Zanzibar and Mombasa, and wild some miles away from the latter town on the mainland. It flies with a quicker stroke of the wings than one would expect from their length."

Capt. Shelley, writing on birds from British Central Africa (*The Ibis*, 1901, p. 176), says the native name is *Ngwi*. Later in the same volume (p. 593) he spells the name *Ngwe*.

Stark and Sclater ("Birds of South Africa," Vol. III., pp. 227, 228) say:—"The Woodwards found these Parrots pretty common on the thorn flats of Zululand: "They are generally seen in pairs, and fly very rapidly, uttering shrill screams. They are fond of wild figs, the fruit of a huge species of banyan tree, which grows along the banks of many of the larger rivers, and we have seen them feeding on green mealies in the Kaffir mealie gardens. These Parrots make round holes in the dead trees, where they lay their eggs. We found one; it was pure white, and nearly round."

Mr. C. F. M. Swynnerton, writing on the birds of Gazaland, says (*The Ibis*, 1907, pp. 297, 298):—"A single specimen of this Parrot was brought to me in April, 1895, by a native, who had caught it with bird-lime in the Jihu; it lived in my aviary till November, when it died. Though wild enough for a time, it was remarkably tame for a fortnight or so before its death, climbing down daily to my hand and picking the grains from a mealie-cob; it was noticeably sick only for a day before its death. This sudden tameness before death appears not to be uncommon, Mr. Marshall informing me that he has seen several instances of it in his aviary at Salisbury."

In *The Ibis* for 1908, the same writer says (p. 418):—"Two of these Parrots flew over my homestead near Chirinda on August 29. It is the common species of the low veld, and I came across it constantly in travelling from Inyajena to Chibabava and on to Chironda, as well as in the Madanda forests during December and January. It might usually be heard all day in the dense foliage of the large Trichilias and other trees in parties of as many as six or seven together. Under these circumstances a continuous conversation of comparatively pleasant conversational notes is kept up, the shriek uttered in flying being somewhat harsher, though less piercing, than that of our other two species. It is far tamer than either of these, and will usually permit anyone to pass under the tree without moving, though even then its green coloration renders it very difficult to detect amongst the dense foliage."

Russ says this is rare, and received singly in the market. The first two specimens exhibited in the London Zoological Gardens were presented in 1870, and I do not know of others having arrived there since that date.

YELLOW-FRONTED PARROT (*Pœocephalus flavifrons*).

Green, with brighter edges to the feathers; lower back, rump, and upper tail-coverts paler and brighter, yellower at base of feathers; flights brown, greenish and edged with green on outer webs; tail olive-brown with a golden sheen; forehead, top of head, lores, orbital region, and upper part of cheeks yellow; lower breast, abdomen, and under tail-coverts brighter green than upper back; thighs more or less yellow; tail below golden olive-brown; beak pale dusky horn-colour, with more or less whitish under mandible; feet ashy or blackish; irides red or reddish. Female not differentiated. Hab., North-east Africa from Shoa to Abyssinia.

Heuglin says ("Ornithologie Nord-Ost Africa's," 1, 2, p. 742):—"I found this species not rare in January in Ataba Valley in the Abyssinian province Telemet, at

5,000 to 8,000 ft. above sea-level, in narrow moist defiles, upon thickly-leaved tall trees. They live together like their allies in flights of three to eight specimens, are lively, but appear to be somewhat heavy in their movements, and in their sudden, rattling, and direct flight utter an unpleasing whistled note. The food consists of cereals, berries, pulp and kernels of the fruits of *Adansonia digitata*, etc. Whether resident I cannot say."

Alfred E. Pease (*The Ibis*, 1901, p. 679) says:—"The Yellow-fronted Parrot was seen only on the higher Hawash and near the Meki River." He describes the soft parts as follows:—"Iris orange-brown; upper mandible black-grey along the ridge, lower mandible greyish-white; legs black."

Russ says ("Handbuch für Vogelliebhaber," p. 230): "A pair in the possession of Mr. Fiedler, of Agram, soon became tame; otherwise it has hitherto only occurred in the Zoological Gardens of Frankfort-on-the-Maine."

Senegal Parrot (*Pœocephalus senegalus*).

The upper parts are mostly grass-green, but the head, cheeks, ear-coverts, and throat vary from brownish to blackish-grey; the quills and tail feathers are brown, the outer webs edged with green, under parts yellow, more or less tinted with orange, a belt across the breast, and the thighs green; beak blackish-brown; feet dusky brown; iris varying from yellow to brown, perhaps sexually.

In the female the head is of a paler grey, the under parts not orange tinted, and the under tail-coverts yellowish-green. The beak is probably lighter in construction. Hab., Gambia, W. Africa. When at liberty this species is very destructive to the crops of banana, rice, maize, etc.

Mr. J. S. Budgett (*The Ibis*, 1901, p. 484) says that he identified this species on the Gambia River in large flocks of over twenty, and later (p. 495) he says:—"M'Carthy Island, December 7, 1899. Very common in flocks." I have found no other field-notes.

Dr. Russ says that when acclimatised this Parrot is beautiful, vigorous, and enduring; he observes further on: "A pair in my bird-room were wild and excitable; both shrieked piercingly when approached, and every attempt to tame them was without result. When nervous, an astonishing squeaking, and, when in great terror, a penetrating whistle. They took possession of a nest-box, flying to it at first only from shyness and wildness; nevertheless, they began to nest. The male performed a wonderful love-dance. Laying three eggs, round and comparatively small; they were devoured by the male. Soon, moreover, the female was killed by him."

The above account will doubtless be a great encouragement to owners of this amiable Parrot to try and breed with it. It is probable, however, that Dr. Russ's male was captured when adult, for birds when taken young are said to be usually docile, and some of them have even been taught to speak.

The first specimen of this Parrot exhibited at the London Zoological Gardens was presented in 1853, since which date many others have found a home there.

Meyer's Parrot (*Pœocephalus meyeri*).

The male has the head, neck, mantle, wings, and tail brown with olive shading, often with a broad crescentic yellow band across the crown; back, rump, upper tail-coverts and under parts, bluish-green; bend and edge of wings, under wing-coverts and thighs, yellow; beak dark greenish horn; feet greenish-black; naked skin round eye, black; iris orange-red, or brownish externally, red internally. The female is smaller, and has a much less powerful beak, with shorter terminal hook. The young are said never to have the yellow band across the crown, the feathers of the mantle and the wing-coverts with green edges, the yellow feathers at the bend of the wing and the under wing-coverts with brown bases, the thighs green; the lower back and rump bluer, and the lower parts decided green. Hab., from Abyssinia through Eastern Africa to the Transvaal and thence across the Continent to Damaraland.

According to Von Heuglin, this bird is met with chiefly in the forest region in companies of as many as ten individuals; it breeds in holes in trees during the rainy season, and may be easily tamed. In the late autumn it assembles in considerable crowds, which wander noisily from one lofty tree to another, even into the steppes, where far and wide no water can be discovered. Von Heuglin says he has never seen either this or any other N.E. African Parrot drinking. The call-note consists of an extraordinarily piercing whistle. The flight is straight, powerful, and noisy, rarely somewhat swerving.

Stark and Sclater say ("Birds of South Africa," Vol. III., p. 229):—"Meyer's Parrot is perhaps the most widely distributed and the commonest of South African Parrots. It is found in pairs or small parties among high thorn bushes or along the wooded banks of rivers and periodical streams. As with other Parrots, its flight is rapid and headlong and its note a shrill scream. Holub is the only observer who has noticed the nesting habits of this species; it builds in a hole in a tree, either making it itself or adapting to its needs that of some smaller bird. Holub did not discover the eggs, which are doubtless white, like those of other Parrots.

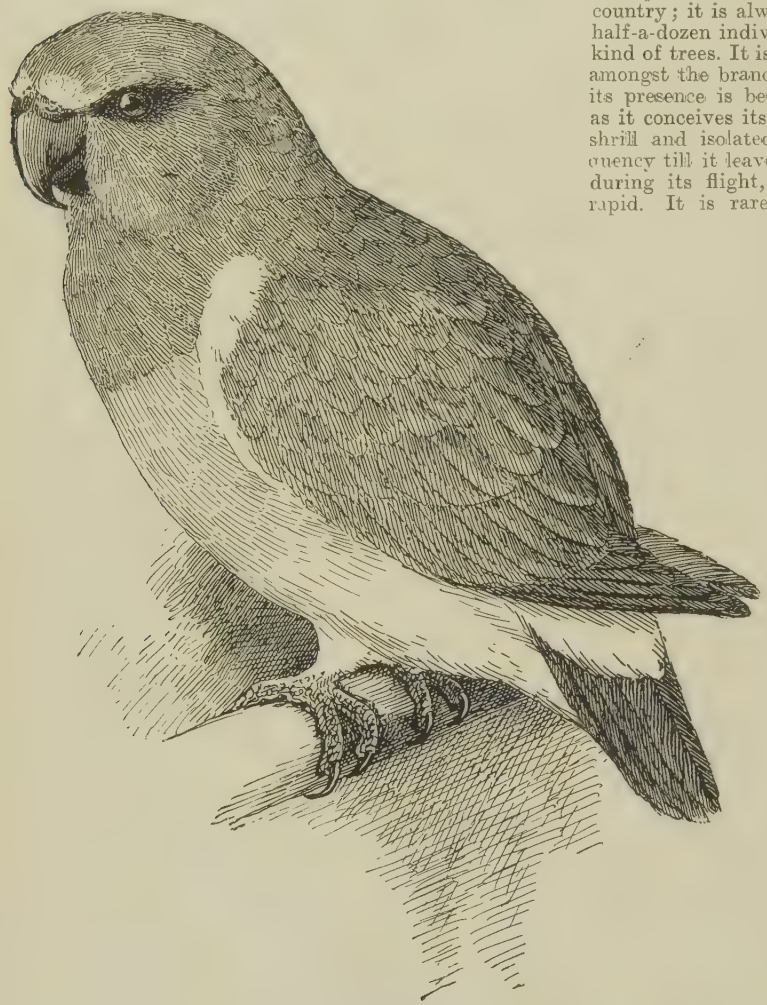
"This bird is often kept as a pet and becomes exceedingly tame; it is to be seen on many of the farms in the Western Transvaal flying in and out of the houses and taking food from the hand. It will eat bread, cooked and uncooked fruits and vegetables, grain and even raw meat, but this latter diet is stated by Holub to cause the birds subsequently to pull out their feathers, a trick not uncommon among caged Parrots."

Mr. B. Alexander (*The Ibis*, 1900, pp. 429, 430) says:—"Fairly plentiful from Tete onwards. Observed generally in companies, but now and again in couples, frequenting the wooded banks of dried-up water-courses dotted with pools. At the end of August this species was breeding, when all the males kept company together." Mr. Alexander goes on to discuss the characters upon which the sub-species *erythreæ* and *transvaalensis* have been separated, and shows that they are extremely variable. Perhaps there is more excuse for an ornithologist to name so-called sub-species than there is for an entomologist, since the latter always has plenty of new species to which he can stand sponsor, whereas the ornithologist meets with new forms at comparatively long intervals unless entirely new ground is explored.

Mr. A. L. Butler, writing about the ornithology of the Egyptian Soudan (*The Ibis*, 1905, p. 360) says:—"I have seen Meyer's Parrot only in Kordofan, where, from the vicinity of El Obeid to Mazrub, it was met with almost daily, though always in small numbers. The birds were most frequently in pairs, but sometimes in parties of seven or eight. They keep principally to the huge 'baobab' trees, which in Kordofan are scattered through the thorn-bush, and in these they doubtless

breed. They are very little birds, difficult to approach, and take a good deal of hitting to bring them down."

Dr. Russ speaks of this as a rarely imported Parrot; a pair which he possessed died from excessive heat during the month of June. Whether Meyer's Parrot is more freely imported into England than into Germany I do not know; but, since the London Zoological Society



MEYER'S PARROT.

first acquired the species in 1855, a good many examples have found their way to the Gardens; it is rare in private collections.

RUEPPELL'S PARROT (*Pœocephalus rueppelli*).

General colour smoky brown; feathers of rump and upper tail-coverts with darker edges; bend of wing and front edge yellow; sides of head greyish, the ear-coverts decidedly silvery-greyish; under wing-coverts and thighs yellow, the latter more or less tinged with orange; beak and feet dark horn-colour; irides orange. Female smaller, with the lower back, rump and upper tail-coverts bright blue; vent and under tail-coverts washed with paler duller blue; beak less powerful. Hab., "South-Western Africa from Benguela, perhaps also from Gaboon, to Damaraland" (*Salvadori*).

In Sharpe and Layard's "Birds of South Africa," p. 196, we read: Mr. Anderson gives the following note:—"This species is common in Damaraland, but is chiefly found in the middle and southern parts of that country; it is always met with in small flocks of about half-a-dozen individuals, and seems to prefer the larger kind of trees. It is rather shy, and when quietly perched amongst the branches is very difficult to perceive, until its presence is betrayed by the cries it utters as soon as it conceives itself to be in danger; these are at first shrill and isolated, but increase in strength and frequency till it leaves its perch, and are usually continued during its flight, which is generally short, but very rapid. It is rarely found far from water, which it usually frequents twice a day. It feeds on seed and berries, sometimes also on the young shoots of trees and plants."

Russ does not mention this species in his Handbook; but in 1882 four specimens from Western Africa were purchased for the Zoological Society's collection in Regent's Park; two others were subsequently received dead from Mr. Jamrach (who probably sent them for examination in order to decide the sexual differences; the year following a third (living) example was presented to the Garden reputed to be from East Africa.

This completes the Parrots of the sub-family *Pioninæ* and brings us to the nearly related forms of the sub-family *Psittacinæ*.

SUB-FAMILY PSITTACINÆ.

Typical Parrots.

The general colouring of these birds is either grey or brown, often with a certain amount of red; they are characterised by the broad cere at the base of the upper mandible, narrower below the nostrils; the latter rounded, not encircled by a swelling; the orbital region and often the lores occupied by an extensive naked area; beak without notch, the lower mandible longer than deep. The species inhabit the Ethiopian Region, Madagascar, the Comoro and Seychelles Islands, and one genus and species comes from New Guinea.

In captivity the imported species of this sub-family, when first imported, and if unable then to crack seed, should be fed upon maize, boiled for two hours, and banana; so soon, however, as they are old enough to take hard food, a mixture of one part wheat, two dari, two hemp, and two canary (by measure) should be gradually substituted for the boiled maize; nuts should be added in winter, and green peas in the pod in summer; fruit also should be given daily, especially

banana, grapes, ripe pear, or orange; and, as an occasional treat, a piece of cracker or other plain dry biscuit. Of course, pure water should be supplied to these, as to all other Parrots, but no other form of drink.

Grey Parrot (*Psittacus erithacus*).

The adult bird is of a deep ash-grey, slightly paler on the under parts; the tail is crimson, the beak is black, the upper mandible with a powdery white cere; the upper part of the face, which is naked, is also of a powdery whitish character; the feet are darkish grey; the iris of the eye, which is silver-grey in the young bird, changes to pale yellow as it becomes adult. Female more thick-set, with a broader rounder head; the naked patch on the side of the head rounded instead of obtusely pointed behind; the posterior angle of the lower jaw more acutely pointed, the beak shorter and more compressed just before the terminal hook; as a general rule the colouring is deeper, but individuals vary in this respect. Hab., Western Africa from Senegambia to the Congo and Prince Island; also across the continent to the Victoria Nyanza.

Some examples have a good many red feathers irregularly scattered over the body, and it has been stated that they are sub-specifically distinct and occur only in the Interior; it has also been asserted that these birds are more talented as talkers, but this I greatly doubt.*

Dr. Otto Finsch, in his monograph of the Parrots, says that in its native country this species is very abundant; it feeds on fruits and various seeds, but especially palm nuts. Its breeding season is in December, after the rains; it selects, for purposes of nidification, a deep hole in a tree, in which it deposits five white eggs. Within a certain radius one may often find some hundreds of pairs breeding, but rarely more than one pair in the same tree.† The natives are afraid to take the young birds from the nest, as they have a superstition that so much heat is generated there as to burn one's finger (a very natural superstition when one considers the formidable beak of this bird); they therefore wait until the young have flown and then snare them, afterwards usually selling them to strangers at the rate of about a dollar apiece. Dr. Finsch attributes the absence of Kites on Prince's Island to the fact that the Grey Parrot is there so abundant. He says that birds of prey are frequently seized and destroyed by them on the wing. On the other hand, J. G. Keulemans, the well-known bird artist and traveller, says: "On Prince's Island we find these birds in great abundance, while on the neighbouring island of St. Thomas not a Grey Parrot is to be seen, a fact to be accounted for by the large numbers of the Kite (*Milvus parasiticus*) inhabiting the latter island." No doubt both views are correct; both of these colonies (or nations, so to speak) of birds are powerful, each has a wholesome dread of the other, and keeps to its own dominions. This Parrot is essentially "gregarious; it not only nests in communities, but it is always to be seen in flocks. In time of danger (says Keulemans) the old birds defend their progeny vigorously, and should the enemy prove too strong to be successfully resisted by one pair, other Parrots come up to their assistance, and, joining forces, either kill or put the aggressor to flight."

Mr. Frank Finn, writing on "Birds Observed in Eastern Africa" (*The Ibis*, 1893, p. 229), says that *P. erithacus* is a "common pet with Hindoos, Goanese, and Europeans, being brought down from the interior."

According to J. H. Gurney (*The Ibis*, 1899, p. 29), Le Vaillant speaks of a Grey Parrot which began to lose its memory at sixty, to moult irregularly at sixty-five, and to become blind at ninety, and died at ninety-three; but he thinks it hardly sufficiently established to be included in an authenticated list of the ages to which birds live. It is nevertheless quite likely to be a fact.

Oscar Neumann (in the "Journal für Ornithologie," 1899, p. 33) says that he met with a small flock of *Psittacus erithacus* in Kiva Kitoto, in Kavironda, on the east shore of the Victoria Lake—the most easterly point of its occurrence recorded—and found it abundant among the banana gardens of Ussoga, north of the lake.

F. J. Jackson, describing birds obtained in British East Africa (*The Ibis*, 1902, p. 612), speaks of examples of this species obtained by him at Entebbe as having the "iris dark grey." This would give them a very different appearance from the ordinarily imported Western specimens.

The Grey Parrot.

Writing on the birds of Fernando Po, Mr. Boyd Alexander says (*The Ibis*, 1903, p. 397): "Constantly observed passing high overhead in large flocks. It is a migrant to the island."

Few birds are more freely imported, and probably none are more widely popular, than the Grey Parrot. Nevertheless, owing chiefly to the unnatural treatment to which these birds were generally subjected when first imported, I believe that, up to the end of the last century, Mr. Abrahams' estimate that only 2 per cent. of those imported lived to become household pets. was literally true; and even now, in consequence of the prevalent ignorance of the requirements of Parrots in the case of many dealers and more purchasers, the mortality is still much higher than it need be. Since 1898 I have waged perpetual warfare against the hopelessly injudicious feeding to which this unhappy bird is generally exposed; and, from letters which I have received from time to time, both from thoughtful dealers and private individuals, I know that attention to my directions for the treatment of the Grey Parrot has resulted in the salvation of many specimens which would otherwise have been irremediably lost; but so long as purchasers continue listless respecting the com-

* This form is called the "King Parrot" and is common at Cassenge, in the interior of Loanda.

† On the other hand, Mr. Keulemans says:—"Often in one tree two or more holes may be seen occupied by hatching pairs."

fort and health of their birds, and (to save themselves a little trouble) are satisfied to purchase the first packet of hopelessly impossible seeds which claims to be a suitable food for every kind of Parrot, so long also as they persist in the senseless supposition that because a Parrot talks it can be kept in health upon human food, just so long will this interesting bird suffer from all the ills to which a maltreated bird is heir—vomiting, lassitude, diarrhœa, cramp, fits, dryness and irritation of the skin, inducing feather-plucking, tumours, septicæmia, and early death.

I do not doubt that unhealthy conditions during importation may be the cause of death in some cases, but unquestionably by far the greater number of Grey Parrots which die after importation would live if correctly fed from the beginning, instead of being poisoned with sopped bread, table scraps, and so-called "Parrot food," with most unwholesome and unnatural drinks.

I have had to recommend treatment for many hundreds of these birds, and I find, almost invariably, that a bird which appears to be suffering from a severe cold, accompanied by vomiting and diarrhœa, has been fed partly upon sop in some form or other—bread and milk, bread or toast soaked in some breakfast drink; then a bird which plucks itself has more often than otherwise had some kind of animal food—butter, cheese, egg, bones, or some kind of flesh; a bird with cramp has often been fed upon "Parrot food" alone and has selected certain seeds—perhaps maize and sunflower—throwing over all the others, and has got itself into a thoroughly unhealthy condition in consequence. For a Grey Parrot when at liberty maize in the milky stage, millet, and other cultivated cereals are natural food; but that is no reason why the same bird in captivity should be restricted to hard horse-tooth maize and sunflower, with no variety unless it chooses to eat prairie-grass seed, pumpkin seed, dry bread stained with turmeric, monkey nuts, and dirt; or as a change dry chillies. As for fruit, of which in its wild state the Grey Parrot eats quantities daily, the owners of many unhappy individuals never think of it as a necessary article for the bird's daily consumption.

On May 20th, 1899, I had a young Grey Parrot sent to me from Liverpool. I got it from an approved source, and it reached me in tolerably good health, although its bowels were somewhat relaxed. In the cage I found boiled horse-tooth maize and the remains of what looked like brown bread sop. I continued to give boiled maize for several days, adding thereto hemp, wheat, dari, canary, and cracknel biscuits; I also gave bananas, which the bird seized and devoured ravenously. To cure the diarrhœa I gave the bird a piece of cuttlefish bone to chew up.

After a few days my Grey refused the boiled maize, and I substituted a piece of stale household bread (about a cubic inch), a piece of boiled potato of about the same size, and part of an orange. Later on, as oranges became scarce, I substituted pears and sweet-water grapes, with walnut occasionally. If the bird sneezed, I promptly mixed a few chillies with his seeds.

Although I had decided what to feed my bird on before I purchased it, I made the unfortunate mistake which many other Parrot owners make of covering the cage over at night; the result was that after it had been some time in my possession and had become an accomplished talker, it began to pluck out its breast-feathers, and I only discovered the cause of the trouble when it was too late to cure it. Across the bare patch on the breast I saw several small black creatures running—parrot-lice, as I discovered as soon as I examined them through a lens. These wretched little parasites, when seen with the naked eye, look not unlike the *Physopoda* of the genus *Thrips*, which are so mischievous in greenhouses; but, when magnified, they are seen to be true lice (*Anoplura*), and bear a fugitive resemblance to the Rove-beetles (*Staphylinidæ*) of the genus *Stenus*, though not when examined in detail. On examining the cover I found dozens of these insects concealed in the folds, where they had harboured and bred. Of course, I speedily got rid of the cover and powdered the bird well with pyrethrum. All the parasites were exterminated, but the feather-plucking habit induced by the irritation was established, and therefore persisted in to the end.

I do not think there is much to be learned by repeating the words and sentences spoken by any particular Parrot. Each bird repeats what has been taught, occasionally picking up a word or sentence which it has chanced to hear, and sometimes unintentionally (very rarely with intelligent comprehension of the meaning of the words) uses them in an apposite manner. A Parrot easily learns to comprehend the meaning of names, and, having learned to know different persons by their Christian names, never confuses one with another. Thus my bird knew that its own name was Bobby; it knew me as Arthur, my wife as Mary, my man as Tom, and his sister as Ann. It would always call us by name with perfect discernment. If I were making a fuss over my English Jay, the Parrot usually became jealous, and called out, "Arthur! Arthur! Bobby's a pretty boy," or "Poor Bobby!" and gave me no peace until I took notice of him. Why Parrot-owners almost invariably call their birds—both male and female—"Polly," and speak of them as she, I never could understand.

My bird was poisoned early in 1905 through eating a berry of *Solanum*, given to it in a fit of absent-mindedness by a visitor—I was away from home at the time—the skin of the berry was found on the floor of its cage after its death. I have never purchased another; though if I were restricted to one bird as a pet I think I should certainly choose a Grey Parrot because of the delight which its remarks occasion to young and old alike. The grave manner in which my bird looked at a perfect stranger, saying, "Hullo, old chap! How's your grandmother?" and then as the visitor turned round with a laugh, added with evident conviction, "You're a rascal!" was extremely funny, and, though an old joke to me, gave fresh delight to every newcomer.

The Grey Parrot was successfully bred by Herr Fritz Lotze in 1900, two young having been reared.

Timneh Parrot (*Psittacus timneh*).

Dark grey; lower back and rump pale grey; flights blackish; tail dull deep red, darker and browner at margins of feathers; head and neck with paler edges to the feathers; forehead and orbital region naked and covered with small whitish papillæ; abdomen pale grey; longer under tail-coverts dark grey with a reddish tinge; upper mandible pale horn-colour becoming black towards tip, lower mandible black; feet grey; irides pale yellow or yellowish-white. Female smaller than the male, and in other respects differing as in the preceding species. Hab., Liberia and Lower Sierra Leone. Doubtless the habits of this species in a wild state nearly resemble those of the Grey Parrot, which it replaces in Liberia. According to Russ it was regarded either as a young plumage or aberration of *P. erithacus*, but is now established as a distinct species;

he says it is rare in the trade, but generally known. "One in the possession of the Baroness von Schlechta was comical in its behaviour and extremely confiding, whistled in a wonderfully clear tone, spoke plainly, and also to some extent, but in a peculiarly drawling fashion, uttered a clear, shrill cry. In all other respects like the Grey Parrot. Price 30-75 marks."

This species was first purchased by the London Zoological Society in 1861, and several other examples have been exhibited at the Gardens since that date.

Greater Vasa Parrot (*Coracopsis vasa*).

Blackish-brown; wings, lower back, upper tail-coverts, and tail glaucous-grey; lesser and median upper wing-coverts blackish-brown; under tail-coverts grey, with black shafts; a scarcely perceptible darker band across the middle of the tail; cere and naked orbital skin yellowish; beak black after the moult, whitish later; feet and irides dusky brown. Female smaller, duller, probably with shorter and less powerful beak. Hab., Madagascar; introduced into Réunion.

In the "Proceedings of the Zoological Society," 1884, p. 410, Dr. Sclater calls attention to a singular habit of this species as observed in the Gardens: Two of these Parrots, believed to be a pair (one presented by Mrs. Moon, May 11, 1866, and the other by Mrs. King, March 29, 1882), had been for some time kept together in one large cage in the Parrot-house. "One of these birds—it was not known certainly which of the two, but believed to be the female—had the habit of producing from its cloaca a mass of dark, flesh-coloured substance, about 6 inches long and 4 inches in breadth, and of drawing it in again, after exposing it for several minutes. This phenomenon had been witnessed on several occasions by the keeper of the Parrot house, by Mr. Bartlett, the superintendent, who had kindly prepared a rough sketch of the object, by Mr. Clarence Bartlett, and others.

"The bird appeared to be in perfect health; and the only suggestion Mr. Sclater could make on the subject was that part of the membranous lining of the cloaca in this bird was capable of being blown out in periods of sexual excitement, like the bladder in the neck of the Adjutant (*Leptoptilus*), and the wattles in the neck of the Tragopans.

"The head keeper, Benjamin Misselbrook, had stated that he recollected the same occurrence taking place in the case of a Greater Vasa Parrot in the society's collection some thirty years ago."

At page 562 of the same volume Dr. Sclater called attention to the death of a female of this species which had been presented to the society in 1830, and which therefore had passed nearly fifty-four years in the Society's Gardens. An anatomical examination showed a cloaca of remarkable size, rendering it probable that the previously-described case was due to protrusion of the cloaca by the female bird.

The Rev. J. Sibree, jun. (*The Ibis*, 1891, pp. 212-217), says:—"Two species of Parrot and one Parrakeet are among the denizens of the Malagasy woods and plantations in almost every part of the country.

"1. These Parrots, the one dark grey in colour, and the other slaty black, are both of sober plumage, with none of those brilliant tints which mark many species of Parrot in other parts of the tropics. But they are both intelligent birds, and, like their congeners, can be easily taught to speak a few words and to whistle a tune; they are therefore frequently kept as pets by the Malagasy. The sooty species (*Coracopsis obscura*)* is found also (introduced) in Réunion, but the black one (*C. nigra*) is peculiar to Madagascar. Mr. Cowan speaks of the latter species as having been seen by him in large flocks at Ihòsy and Isàlo, in the Bàra country (south-central region).

"The Sooty Parrot, except in the breeding season, is found in small companies of from six to eight individuals. Its food is rice, seeds, roots, and wild fruit. A Malagasy proverb, whose 'moral' is to reprove a too easy-going, changeable disposition, speaks of 'a male Parrot seeking fruit in the forest; he finds a luscious morsel here, but in an instant he is off to get another there.' This bird flies high, but if one of them is shot or wounded its companions will come with sharp cries of defiance at the hunter, as if to save their comrade. This Parrot, M. Grandidier says, is *fàdy*, or sacred, to one of the royal families of the Vèzo Sàkalàva, and he gives the following story as accounting for the origin of the veneration in which they hold it:—

"Làhimerìsa, King of Fiherènana, told me that one of his ancestors was one day walking alone in one of his manioc plantations at some distance from the royal village, when he was surprised by a band of robbers on a marauding expedition from the Bàra country. They did not know the king, who had nothing in his appearance or dress to denote his rank. But seeing his thick chain of gold gleaming under the knobs of hair covered with grease and white clay, they took him unawares, speared him, and possessing themselves of the coveted prize, threw the body into a hastily dug grave and decamped. How long he remained there no one knows; but he was not dead, only seriously wounded; and on recovering consciousness, and seeing nothing but darkness around him, and feeling the earth pressing heavily on his chest, he believed himself in the other world. He was in profound distress; when, suddenly, he seemed to hear shrill, piercing cries, as if a flock of Parrots had passed over his head. He listened attentively; the cries which met his ears were approaching nearer. Doubtless a babbling and restless crowd of them was perched on a neighbouring tree. 'But there are no Parrots in the other world,' thought our hero; 'I am not dead!' He took courage, and freeing himself by a tremendous effort from the layer of earth which covered his body, he perceived the bright shining of the sun, in whose rays the Parrots were sporting in the trees around him. Hope revived within him, and he made his way, not without difficulty, to his village, where, after the needful care and nursing, he eventually recovered strength. In thankfulness to the birds whose cries had roused him from the torpor and given him courage to free himself from his tomb, he solemnly vowed for himself and his descendants, to the latest generation, that they would never kill Parrots."

"The Sooty Parrot is the larger of the two species, the black one being a third less in size; but the latter is found in much greater abundance, and in companies of from six to twelve individuals. Both species are more terrestrial and less arboreal in their habits than most Parrots, nor do they make much use of their claws to convey food to the mouth. These birds have many provincial names besides the common one of *Bolôky*, by which they are known both to the Hova and Bètsilèo. Some of these names seem imitations of their harsh cry, while the meaning of others is obscure, except in so far as they denote their comparative size, as *Koéra* Bé and *Koéra* Kèle (the *large* Koera, the *small* Koera), etc."

Mr. Frank Finn (*The Ibis*, 1901, p. 442) speaks of this as one of the cage-birds which may sometimes be

* This is a synonym of *Coracopsis vasa*.—A. G. B.

obtained at Calcutta. In his "Three Voyages of a Naturalist," pp. 95, 96, Mr. M. J. Nicoll says:—"As we entered the cultivation at the bottom of the valley, a large dark-coloured bird flew overhead, uttering a loud, but most musical, whistle. This proved to be one of the Madagascar "black" Parrots—*Coracopsis vasa*. We were much surprised at the extremely rapid flight of this bird, as it dashed over us with outstretched neck into the forest. The following day we had a good view of a pair of these Parrots sitting in the top of a tree close to the camp, and we also became acquainted with a smaller species—*C. nigra*. These Parrots are, we were informed, quite common in every strip of forest in the neighbourhood of the Camp d'Ambre."

This species nests in holes of lofty, vigorous trees in primitive forest or in almost inaccessible rocks; apparently it produces two broods in the year, each consisting of two young ones; the female incubates, the male meanwhile uttering throughout the day, and even in the evening if the moon is shining, a long-drawn whistled note, varied with softer flute-like sounds (cf., Russ, "Handbuch für Vogelliebhaber," p. 247).

Although not attractive in appearance, this bird is amiable, hardy, not especially noisy or destructive, and is long lived; that it is capable of being taught to talk and whistle we have already seen, though the late Dr. Greene seems to have been a trifle sceptical regarding its talents. Russ gives its price as from 30-45 marks per specimen.

The London Zoological Society seems to have acquired specimens at rather long intervals, their first example having been presented in 1830, their second in 1866, a third in 1882, and a fourth in 1888.

Lesser Vasa Parrot (*Coracopsis nigra*).

Smaller than the preceding species, and with the naked orbital skin rose-colour; beak black after the moult, whitish later; feet blackish; irides brown. Female smaller than male, apparently with shorter and slightly weaker beak. Hab., Madagascar.

I have found no additional field-notes dealing with this species. Russ says it is "even quieter than the preceding, as well as ill-tempered and unteachable. Screeches continuously in an unpleasant manner, with melodious whistling for variety. I could not discover a capacity for speech. In the trade, like the preceding, it is offered singly. Price 15-20 marks." It first reached the London Zoological Gardens in 1857, then in 1872 three were received, and others have come since that date.

Praslin Parrot (*Coracopsis barklyi*).

Pale brown; primaries greyish on outer webs; crown with ill-defined paler spots; beak horn-brownish, paler at tips; feet black; irides dark brown. Female smaller than male, with a smaller, weaker beak. Hab., Praslin, Seychelles Islands.

This Parrot was received by the London Zoological Society in 1867, and described by Mr. E. Newton, a coloured illustration being published in the "Proceedings of the Zoological Society" (Plate XXII.). In 1871 a second example was received in exchange; in 1874 a third was presented and two others deposited. The last recorded, in the ninth edition of the "List of Animals," was deposited in 1888.

In *The Ibis* for 1906, p. 709, Mr. M. J. Nicoll, writing on the Birds collected and observed during the Voyage of the "Valhalla," says: "I saw only one example of this Parrot, an immature female, which I obtained. It was feeding in a Magnolia, the only tree of its kind on the island. These birds are strictly preserved by M. Edouard Boullé, the owner of the estate on Praslin where they are found. Formerly they were killed in numbers by the natives for food. M. Boullé told me that he has recently seen about one hundred individuals together. The note of this Parrot is a very musical whistle, somewhat resembling that of *C. vasa* of Madagascar."

Russ says that, in addition to the specimens in the London Zoological Gardens, it was offered for sale in 1881 by Anton Jamrach. If it continues to be strictly preserved it is not very likely to be offered again.

This species concludes the imported *Psittacinæ*. We now pass on from these sombrely-coloured birds to the brilliantly-coloured Noble-parrots (*Edelpapageien* of the Germans) and Ring-necked Parrakeets, the Lovebirds, Hanging Parrakeets, and a few others.

CHAPTER XIII.

SUB-FAMILY PALÆORNITHINÆ.

(Eclectus Parrots, Ringnecks, Lovebirds, etc.).

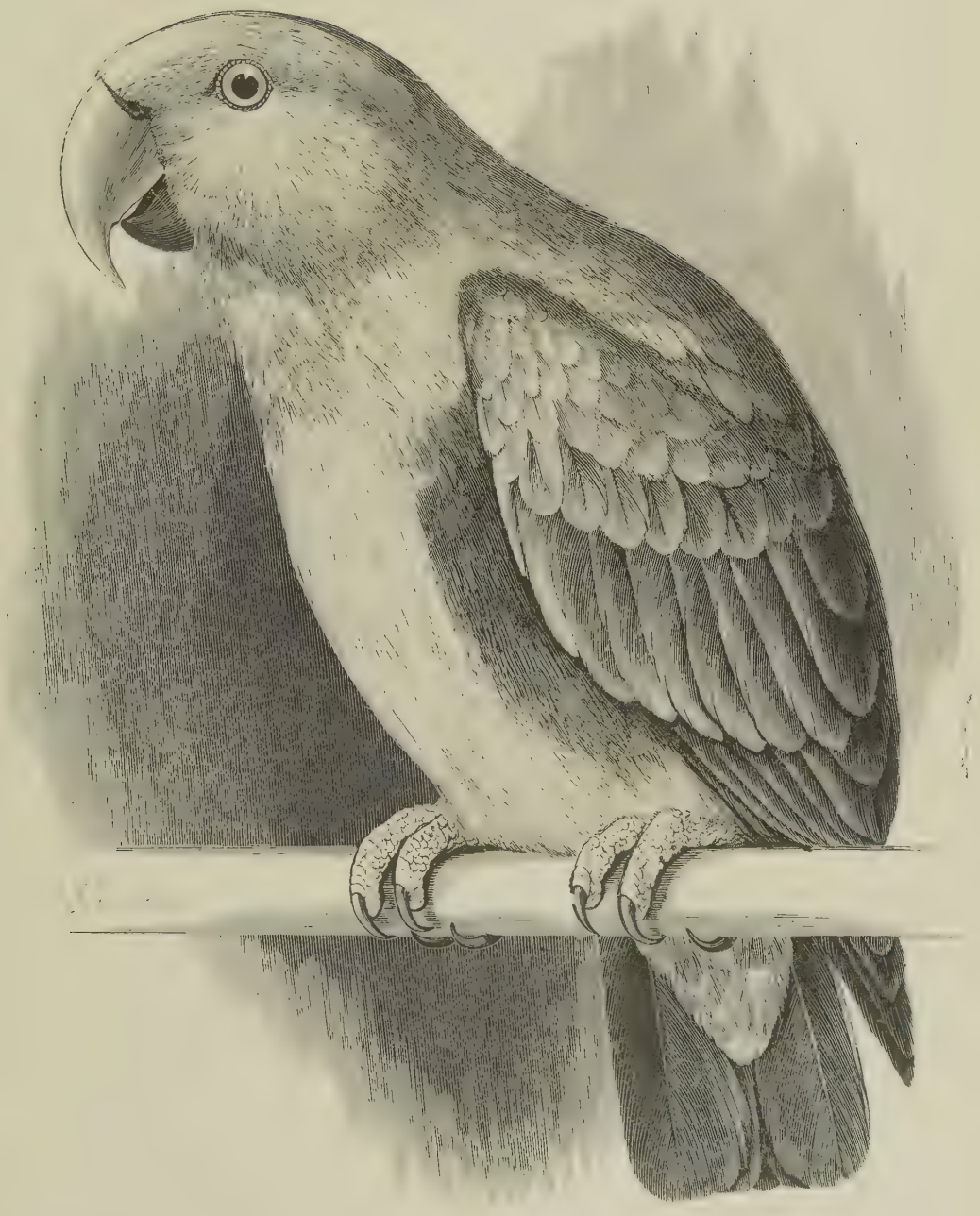
This is a group of brightly-coloured birds, in many of which the sexes differ in pattern and colouring; in some the tail is long and graduated, in others short and square as in some of the typical Parrots. The beak is powerful, smooth, often red in colour, the culmen rounded, smooth, or with a longitudinal groove; the cere is narrow, of equal width, surrounding the whole base of the beak, generally partly feathered. In the wing the second and third flights are usually the longest. All the species are from the Old World. Each group requires somewhat different treatment in captivity.

The Eclectus-parrots (*Edelpapageien* in German) should, according to Russ, be fed in captivity upon hemp, maize, sunflower, canary and paddy-rice, a little sweet fruit—cherries, pears, apples, etc. (he furthermore recommends somewhat damped bread, which I should not advise), and fresh green twigs of "pointed-leaved trees"—doubtless plum, cherry, etc. I should certainly add nuts in winter, since these birds eat them when at liberty.

Red-sided Eclectus (*Eclectus pectoralis*).

The adult male is brilliant green, the edge of the wing blue, the flights dark blue, the outer webs more or less green, tail feathers with yellowish tips, the central ones green, the others blue, with more or less green on the outer webs, the outermost feather, however, with little or none; sides, under wing-coverts, and axillaries red; flights and tail below black; beak with red upper mandible and black under mandible; feet black; iris red.

The female is quite different: the head, neck, and breast dazzling red, a narrow ring encircling the eye, a band across the upper back, the edge of wing, chest, abdomen, and under wing-coverts blue, sometimes purplish; primaries and their coverts blue, their outer webs edged with green; outermost secondaries with their tips and part of their inner webs blue, otherwise blood-red with greenish inner webs; back, excepting in front, rump, upper tail-coverts and tail blood-red, the latter with paler tip, and on the underside with



RED-SIDED ECLECTUS.

dusky base and golden glossed middle; beak and feet black; iris pale yellow. Hab., Papuan Islands, and ranging eastward as far as the Solomon group.

In Duke of York Island and New Britain the natives call this Parrot *Kalangi*. Dr. Guillemard describes the feet as dull olive-green and the iris of the female as orange or yellow. Dr. Russ says of the male: "Upper mandible yellow to coral red, tip waxy yellow, under mandible black, eyes black-brown, narrower ring grey-brown, brown, or orange-coloured; feet leaden-coloured, claws black"; and of the female he says: "Eyes brown, ring round the iris beautifully pearl white, feet grey, the scales and claws black." Altogether there seems to be a great difference of opinion as to the colouring of the soft parts.

Dr. Welchman says that on Bugotu, one of the lesser islands of the Solomon group, the native name is "Kilio" (cf. *The Ibis*, 1895, p. 374). In 1899 an account of the nidification of this species was published in the "Proceedings (Mittheilungen) of the Berlin Museum of Natural History," Vol. I., Part II., by Dr. F. Dahl. Unfortunately I have been unable to refer to this work. Russ says that in 1879 Dr. Platen imported nine examples of this species. He mentions the German price at 50 to 60 marks for the male; 60 to 75 and even up to 120 marks for the female.

It is not at all unusual for females of this species to lay eggs in captivity, and there should be little difficulty in breeding with a pair in a strongly-constructed large outdoor aviary. As a cage-bird it is not especially interesting, apart from its gorgeous colouring, as it is sluggish in its movements and seems to take little interest in anything going on about its cage; though I believe it has been taught to speak a few words, neither this nor any of the species of the genus is anything like so teachable or talented as a Grey Parrot or an Amazon.

The London Zoological Society has at various times exhibited a good many examples of this species at the Gardens in Regent's Park. The first received was a female, which was presented in 1859.

Grand Eclectus (*Eclectus roratus*).

The adult male nearly resembles that sex of the preceding species, from which it differs in the slightly duller and yellower green colouring and the usually bluer lateral tail-feathers; upper mandible red tipped with yellowish, under mandible black; feet black, iris red. The female is red, brighter on the head; the nape, mantle, chest, and abdomen purple, the breast with a wash of the same colour over the red; primaries and their coverts deep blue; secondaries, excepting the innermost ones, with blue inner webs and tips, a band at the extremity of the tail and the under tail-coverts yellow, tail below orange-red, dusky at the base; beak and feet black; iris yellow. Hab., Halmaheira group of the Moluccas.

Dr. Guillemard says that in the Island of Batchian both sexes have the iris yellow. He also observes: "These birds, though caught and kept in confinement in considerable numbers, appear rarely to get tame, and I have never heard them talk."

I have been unable to discover any facts respecting the wild life of this bird.

Dr. Russ says that it is not abundant, though generally known in the market. Dr. Platen brought home thirty males and twenty-four females of the New Guinea and Halmaheira Eclectus Parrots.

In 1880 and 1884 two Germans succeeded in so far rearing young of this Parrot that the latter left the nest alive; but Dr. Frenzel, of Freiberg, in 1881 succeeded in breeding the species successfully, after which the same pair had several unsatisfactory broods. Mr. Hieronymus, of Karlsruhe, reared two broods in 1884 and one in 1885. Both young of the earliest brood nevertheless died when five and six weeks old respectively; but, in the second one female and in the third one male reached maturity. The laying consisted of two eggs only, at intervals of three days; duration of incubation, thirty days. The female alone brooded the eggs, being fed by the male; the latter also fed the young after they left the nest, and retired with them to the nest-box at night excepting in the case of the young cock bird, which was fed by the female only. This successful breeder was awarded the gold medal in recognition of his achievement at the "Ornis" Exhibition, held at Berlin in 1887. The young male became very tame, and learnt to speak ten or twelve short sentences.

The London Zoological Society purchased its first three specimens of this Parrot in 1865, and has continued to add others at comparatively short intervals ever since. Both this and the preceding are well-known show birds, for which their brilliant colouring and apathetic behaviour render them eminently suitable. As they are always likely to take a prize, this helps to counterbalance their high market price.

Ceram Eclectus (*Eclectus cardinalis*).

Smaller than the preceding, and of a purer, darker green; the blue on the tail restricted to the sub-terminal portion of the lateral feathers and the external web of the outer one, the terminal yellow band narrower; upper mandible red tipped with yellowish, under mandible black; cere greyish-black; feet blackish; irides golden-yellow. Female smaller than the preceding species, with the red on back and wings duller; the blue primary-coverts narrowly edged externally with green; tail tipped with bright red tinged with yellow; under tail-coverts also red, the longer ones more or less yellow; beak and feet black; irides yellowish. Hab., Amboyna, Ceram, and Bouru.

In an article on the coloration of the young in *Eclectus* (*The Ibis*, 1890, pp. 28, 29) Dr. A. B. Meyer says: "Mr. Hieronymus paired a female of *Eclectus cardinalis* (Bodd.) from Ceram with the male bird which had been productive with the female of *E. roratus*, and got the following results:—

1888.—First deposit, 2 embryos.
Second deposit, 2 embryos.
Third deposit, 2 unimpregnated eggs.
Fourth deposit, 2 *young birds*, which died after one or two days.
Fifth deposit, 1 *green male* (which was reared) and 1 embryo.

1889.—First deposit, 2 embryos.
Second deposit, 2 unimpregnated eggs.
Third deposit, 2 unimpregnated eggs."

Dr. Meyer is trying to prove that the young males are green and the young females are red from the nest, in contradiction of Dr. Gadow's assertion that the young are "reddish but not yet green." The experiments of Hieronymus are of interest to the aviculturist as showing how rarely the breeding of the species is successful as compared with the failures. Dr. Russ says that a male of the Ceram Eclectus went to nest with a female of the Red-sided species in his bird-room, but the latter was so excitable and spiteful that every trifling disturbance caused the destruction of the eggs and tiny nestlings. He tells us that it is extremely rarely imported. Price 100-130 marks for the pair. It is not

recorded as having reached the London Zoological Gardens in the ninth edition of the "List."

Westermann's Eclectus (*Eclectus westermanni*).

Green; edge of wing blue; primaries deep blue, edged with green towards base of outer web; outer secondaries blue at tip and on inner web; primary coverts blue edged with green; tail with a yellowish terminal band, the outer feathers more or less tinged with blue on outer web; under wing-coverts red; upper mandible red, lower one black; feet black. Female differs from that sex of *E. pectoralis* in having a blue collar, but dull purple lower breast; the under tail-coverts of a much darker and duller red; and no blue ring round the eye; both sexes are also smaller than in that species. Hab.—?

Dr. Meyer was of opinion that this species was founded upon specimens kept in confinement, the plumage of which had been arrested in development, and Dr. Sharpe, concurring, believed that they might belong to *E. riedeli*; in 1899, however, a consignment of ten examples (six males and four females) arrived alive in London, and Mr. Rothschild sent a pair to the sixty-fourth meeting of the British Ornithologists' Club, and pointed out that the male differed from all the other species in being entirely green on the breast; the female came nearest to *E. pectoralis*, but differed in having the lower breast dull purple instead of bright blue like the collar. Unfortunately, the habitat of the species still remained unknown.

In 1849 and 1850 this species is said to have been living in the Amsterdam Zoological Gardens; in 1857 and 1865 there were specimens in the London Gardens. Miss Hagenbeck had a specimen in 1882, and (as noted above) ten specimens reached London, six of which died, in 1899.

Cornelia's Eclectus (*Eclectus cornelia*).

Male above dark green, most of the feathers with paler borders; outer webs of primaries deep blue, mostly with greenish edges, inner webs black; tail blue towards tip, yellowish at tip; head and neck paler green; sides of breast and upper abdomen, and under wing-coverts, except at edge of wing, red; primaries below black; tail below also black with the tip sordid yellow; upper mandible orange-red tipped with yellow, lower mandible black; irides orange-yellow. Female red; back, rump, and upper tail-coverts darker; edge of wing, primaries and their coverts deep blue; secondaries with the outer webs red, the inner webs dark green, excepting the outermost secondaries, which are blue, with the base of the outer web green; tail slightly paler red at tip; under wing-coverts red, more or less mixed with blue; tail below golden red; beak black; feet dusky; irides yellowish, with a red outer ring. Hab., interior of Sumba (Lesser Sunda Islands).

In June, 1897, Mr. Rothschild exhibited a pair of this species at a meeting of the British Ornithologists' Club, and stated that it had previously only been known from females which had died in captivity, but recently Mr. W. Doherty and Mr. A. H. Everett had collected a series, including examples of both sexes, in the interior of the island of Sumba.

I have been unable to trace any record of the species being kept in captivity in recent times, but it seems probable (as Russ puts it down in his "Handbook" as the female of *E. westermanni*) that one if not both of the examples of the latter species recorded as living in the Amsterdam Gardens must represent Bonaparte's type of *E. cornelia*, and it is possible that the example referred to in the "Catalogue of Birds" in the British Museum may have lived in the Surrey Zoological Gardens.

Racket-tailed Parrot (*Prioniturus platurus*).

Bright green, yellower on underparts, especially on the under tail-coverts; vertex crossed by a red band; upper wing-coverts greenish grey, becoming delicate bluish-grey towards bend of wing; innermost secondaries yellowish white on inner webs; middle tail-feathers spatulate, the rackets green centred with blue; lateral tail-feathers with deep blue terminal third; flights and tail-feathers below verditer-green; beak and feet greyish; irides brown. Female without red on head and without the greyish shades on back of head, back, and upper wing-coverts which occur in the male; racket feathers shorter. Hab., Celebes, Togian Islands, Siao and Bouton.

A female arrived at the London Zoological Gardens in 1902, and in the following year Mr. Seth-Smith published an illustrated account of the species in *The Avicultural Magazine*, Second Series, Vol. I., pp. 345-347.

The species of *Tanygnathus* would probably do well upon the same food as the species of *Eclectus*. Mr. Seth-Smith simply says "the usual seeds, nuts and fruit."

Blue-crowned Parrakeet (*Tanygnathus luzonensis*).

Green, yellower on interscapular region and under surface; scapulars and sometimes the lower back tinged with blue; flights dark green, the secondaries more or less tinged with blue; smaller upper coverts black near bend of wing; median coverts blue-black, with brownish-yellow borders; greater coverts blue, edged with yellowish-green; primary coverts bluish-green; top and back of head, and sometimes the lower cheeks, blue; upper mandible rose-red, lower mandible pale pinkish-red; feet dusky greenish or olive-brown; irides yellowish-white with an inner brown ring. Female smaller, beak smaller, shorter, and less powerful. Hab., Philippine Islands, including Palawan, Mantanani, the Sooloo Islands, and perhaps the Sanghir Islands.

Mr. J. Whitehead (*The Ibis*, 1890, pp. 41, 42) says: "Very common. This Parrot is one of the first birds that attracts the traveller's attention in Palawan, as it flies swiftly from forest to forest in small flocks, screaming loudly. In flight the wings are often kept much below the level of the body. This species frequents the tops of high trees, feeding on various jungle fruits, but often during the heat of the day they hide amongst thick-foliaged trees only a few feet from the ground, from which they dash out with loud screams when disturbed. Bill rosy-red; feet horny-green; the pupil black, with a small black ring round it."

Professor J. B. Steere (*The Ibis*, 1894, p. 418) says that this species is "the common form found everywhere abundantly" in the Philippines. And again in *The Ibis* for 1896 we read: "The Blue-crowned Parrakeet appears to be universally distributed throughout the islands, and seems to have been fairly common in the low forest of Mindoro." In *The Ibis* for 1897, p. 248, birds from Samar and Leite are described by Mr. Whitehead as having the "iris straw-white, a ring of brown round the pupil; bill rosy-red; lower mandible pale pinkish-red; feet olive-brown."

In *The Ibis* for 1899, p. 397, Mr. Whitehead adds to the above information: "Nesting in numbers in old tree trunks in the month of June in Samar."

According to Mr. Walter Goodfellow, describing the birds of the Volcano of Apo and its vicinity, in South-East Mindanao, the soft parts differ in the sexes as follows:—"*Male.*—Iris cream coloured, shading into olive-green near pupil; bill red, yellowish towards the tip; cere black; feet greyish-olive. *Female.*—Iris pale

olive-green, shading into yellowish-cream on the outer ring; upper mandible coral-red, lower of a more yellowish tinge; feet dark greenish slate coloured."

This is a rarely-imported species, the first specimen of which to reach the London Zoological Gardens was purchased in 1871; a second was presented in 1875.

Great-billed Parrakeet (*Tanygnathus megalorhynchus*).

Green; feathers of interscapular region edged with pale blue; scapulars black, edged with blue; greater upper wing-coverts and flights blue, edged with green; lesser and median-coverts black, the latter edged with bright yellow; tail green, with yellow tips; below yellowish-green, the sides yellow, as are also the under wing-coverts and axillaries; tail below golden-yellow, duller towards the base; beak coral-red; feet lead colour; irides yellowish, with an outer white ring. Female smaller than male, the beak noticeably smaller, and narrower when viewed from above. Hab., "Western coast of Northern New Guinea, the Western Papuan Islands, Mysol, Salawatty, Batanta, Waigiou, and Guebeh, the Northern Moluccas of the Halmahera group, and the Sanghir and Talart Islands; according to Meyer also the Togian Islands." (Salvadori).

Dr. F. H. H. Guillemard (Proceedings of the Zoological Society, 1885, p. 562) describes the soft parts of a male obtained at Weeda Island, S.-E. Halmahera, as follows: "Iris whitish-yellow; bill scarlet; tarsus dull olive-green."

In *The Ibis* for 1879, p. 48, Dr. Meyer says: "It is not easily found, as it retires into the deep forest. In the middle of the day it sleeps or sits quietly, concealed among the green foliage of high trees, and cries very loudly if anyone approaches."

I have found nothing further respecting the wild life. Russ says of it: "A beautiful bird, but its gift of speech is slight. Rare and single in the market. Dr. Platen brought home six specimens. Price hardly to be decided—50, 100 to 120 marks for a specimen." Mr. Seth-Smith does not agree with Russ; he says ("Parrakeets," p. 92): "This Parrakeet is very rarely imported; but if it were common I much doubt whether it would ever be a favourite with aviculturists. It certainly is not beautiful."

This species was first added to the living collection of the London Zoological Society in 1856, after which nineteen years elapsed before a second example was purchased, and in 1884 a third was added, again by purchase.

Mueller's Parrakeet (*Tanygnathus muelleri*).

Green; the neck, interscapular region, scapulars, and under surface yellowish-green; lower back and rump blue; upper tail-coverts slightly edged with blue; lesser upper wing-coverts and primary-coverts edged with blue; median and greater-coverts edged with yellowish-green; tail above with the tip yellowish; under wing-coverts yellowish-green; tail below golden olive-yellow; beak red; feet olive-green; irides whitish-yellow. Female with the beak slightly shorter, less arched, and more compressed before the commencement of the terminal hook than in the male. Hab., Celebes and perhaps Sula and Sanghir Islands.

The White-billed Parrakeet (*T. albirostris* of Wallace), which formerly was recorded as a distinct species in the list of animals in the Zoological Society's collection, is now decided to be the young of Mueller's Parrakeet.

I have found no published field notes relating to this bird. The Zoological Society received its first specimen (adult) in 1857 by presentation; the first young specimen was purchased in 1868, and the following year adult and young were secured together; others have been added since that date. Russ says that it is not rare in the market, but little admired. Dr. Slaten brought home twenty head. Price when freshly imported and rough 20, 30 to 55 marks for a specimen.

Everett's Parrakeet (*Tanygnathus everetti*).

Green; neck slightly yellowish; interscapular region darker, with blue edges to the feathers; lower back and rump deep cobalt-blue; upper tail-coverts more or less edged with blue; smaller upper wing-coverts edged with blue near bend of wing; all the others and the secondaries edged with yellowish-green; primary-coverts tinged with blue; tail with paler tip; head grass-green; under-parts paler yellowish-green; under wing-coverts indistinctly edged with yellowish-green; tail below golden olive-yellow. Female not differentiated. Hab., "Philippine Islands, Samar, Panay, and Mindanao" (Salvadori).

A single example of this rare Parrakeet was imported by the late Mr. Joseph Abrahams in 1882 (cf. Russ, "Handbuch," p. 226).

We now pass on to a group much better known to aviculturists—the Ring-necked Parrakeets and allies (*Palæornis*)—birds in their wild state most destructive to orchards and gardens, especially where peas are grown for food.* In captivity they should be fed upon canary, oats, and hemp; nuts in winter, peas in the pod in summer, and any ripe fruit that may be available daily.

Cinghalese Alexandrine Parrakeet (*Palæornis eupatria*).

Above grass-green; wings darker green; a dark-red patch on the secondary wing-coverts; central tail feathers green at base, then changing to blue, and yellowish at tips; forehead and lores brighter green; a blackish stripe from nostrils to eye; back of head and cheeks tinged with greyish-blue; a broad black stripe from beak downwards and across sides of neck, where it meets a rose-coloured collar round back of neck; under surface dingy-green, excepting on abdomen and under tail-coverts, which are brighter; greater under wing-coverts and flights below slate-grey; tail below yellowish; beak deep cherry-red, paler on lower mandible, yellowish at tip; feet sap-green or leaden-grey; irides pale yellow, with greyish inner circle; eyelid dull-reddish. Female rather smaller; without black stripe from beak round neck, and rose collar. Hab., Ceylon.

Legge ("Birds of Ceylon," Vol. I., p. 170) says:—"Large colonies of this species take up their abode in districts where cocoanut cultivation borders on forests and wild jungle, which afford an abundance of fruit-bearing trees, on the berries of which the Alexandrine Parrakeet subsists. It is also found in openly-timbered country and in forests. It roosts in considerable numbers in cocoanut groves, often close to a village, pouring in about half an hour before sunset in small swiftly-flying parties from all directions, which, as their numbers increase towards the time for roosting, create a deafening noise in the excitement of choosing or finding their accustomed quarters. The fronds of the cocoanut afford them a favourite perch, on which they sleep huddled together in rows. At daybreak the vast crowd is again astir, and after much ado, flying from

* My brother tells me that the speed with which a small flock of the Indian species will empty the pods in a row of peas is simply astonishing.

Alexandrine Parrakeet.

tree to tree with incessant screaming, small parties start off for their feeding-grounds, flying low, just above the trees, and every now and then uttering their full and loud note ke-aar; this sound is more long-drawn and not so shrill as that of the smaller bird, and can be heard at a great distance. Isolated birds have a habit of apparently leaving the rest of the flock and roaming off at a great height in the air, every now and then giving out a loud scream, which often attracts the attention of the traveller or sportsman for some little time before he is aware of the position of the Parrakeet, which is flying swiftly on far above his head. It is a shyer bird than its smaller congener, and rather difficult of approach when not engaged in feeding or in the business of settling down for the night; at the latter time numbers may be shot without their companions doing more than flying out of, and directly returning to, their chosen trees. In the forests of the south-eastern part of the island I observed these Parrakeets resorting at evening to dead and sparsely-foliaged trees, the bare branches of which afford them a similar perch to that of the palm-frond.

"They feed on grain as well as on the fruits and berries of forest trees; and I on one occasion captured a fine specimen which had become entangled in a species of vetch which covered the earthy portions of a rocky islet near Pigeon Island; it had been feeding on the seeds of the plant, and while extracting them from the pod had got beneath the tangled mass and was unable to extricate itself again. In confinement this species is possessed of the usual docility peculiar to the Parrot order, and is a very favourite pet in Ceylon with both Europeans and natives; I do not think it is as often taught to imitate the human voice as the next species, but I have heard it occasionally speak native words with a fair amount of distinctness. Indian writers say that it is taught with facility to speak; but I think that as a general rule in Ceylon it is kept more as an ornament than for its powers of talking, and when newly feathered, with its tail in perfect order, is a very handsome bird.

"Layard writes that he was informed by natives that this bird laid two eggs, building, of course, as all Parrakeets, in a hollow tree. It excavates the hole in which it breeds, generally choosing a small limb, of which the hard shell to be cut through before reaching the interior cavity is not very thick. I have never succeeded in getting the eggs, and therefore can state nothing certain concerning their size."

Less frequently imported than the larger Indian bird. It is impossible to say when (if ever) it first reached our London Zoological Gardens, because all the Alexandrine Parrakeets are united in the Society's List under Scopoli's name of Alexandri, no definite localities being indicated.

Nepalese Alexandrine Parrakeet (*Palæornis nepalensis*).

Much larger than the preceding species, but otherwise (excepting that the back of head and cheeks are greyer) similar in both sexes. Hab., North and Central India.

Jerdon confounds this with the other forms of Alexandrine Parrakeets, so that his notes on the habits need not be quoted here. Hume also unites them all under one heading, but notes the habitat under each observation. He says: "The Rose-band Paroquet breeds in the Kangra Valley in April, laying four eggs in large holes in trees, excavated by the birds themselves. Though I have found plenty of nests with young, I have never taken the egg myself, and owe this information to Major Cock.

"An egg of this species, taken by him, was a very long oval, very much pointed towards one end, white, a good deal soiled, and with little or no gloss. It measured 1.52 by 0.95 inch.

"Of this species Captain Hutton remarks: "Towards the end of January and beginning of February it begins to cut a circular hole in some tree wherein to lay its eggs, which are usually two in number and pure white. The tree generally in request for this purpose is the semul or cotton-tree (*Bombax heptaphyllum* and *malabaricum*), although, sometimes, even the hard-wooded sál (*Shorea robusta*) is chosen; the entrance-hole is a neatly-cut circle, either in the trunk or in some thick upright branch. The trees selected by these birds are not situated in the depths of the forests, but are detached on the outskirts, and, what is curious in such a quarrelsome bird, there are often three or four nests in the same tree. The eggs are hatched in about twenty-one days, and in the middle of March the young birds are about half-fledged and are then removed for sale."

According to Willughby, writing in 1678: "This was the first of all the Parrots brought out of India into Europe, and the only one known to the ancients for a long time, to wit, from the time of Alexander the Great to the age of Nero, by whose searchers (as Pliny witnesseth) Parrots were discovered elsewhere, viz., in Gagandi, an Island of Ethiopia."

This is perhaps the most frequently imported and best known of all the Alexandrine Parrakeets, and it is probable that most of those recorded in the Zoological Society's List from 1855 to 1893 belong to this race.

Indo-Burmese Alexandrine Parrakeet (*Palæornis indoburmanica*).

Differs from the preceding in the brighter red patch on the wing-coverts and in having a narrow blue collar above the rose-coloured one on the back of the neck; beak bright red with yellow tip. Female smaller and without the black stripe and collar. Hab., Sikhim to Tenasserim and eastwards to Cambodia.

In Hume's "Nests and Eggs of Indian Birds," Second Edition, Vol. III., p. 84, we read: "Mr. J. Darling, jun., found the nest of this Paroquet in Tenasserim. He says: 'December 10th. Took four eggs of this bird at Weppitau, a small village at the mouth of the Moulmein River, on the opposite bank to Amherst, some two miles from the seashore. The nest was in the hole of a tree in light jungle, bordering the side of one of the numerous creeks, and which is always flooded at high water. It was 32 ft. from the ground; the entrance was 4 in. in diameter, and seemed to have been made by the bird in order to get to the hollow in the stump. The eggs were about 2 ft. 3 in. below the entrance; there was no lining of any sort, only a few chips on which the eggs were laid.'"

Count Salvadori says that this bird "cannot always be readily distinguished from *P. nipalensis*."

Whether this race has been imported or not I cannot say, but Mr. Seth-Smith includes it and the next in his book on the Parrakeets, and therefore I also include it. It is quite as likely to come to hand as *P. rosa*.

Great-billed Alexandrine Parrakeet (*Palæornis magnirostris*).

Differs from the preceding in its much larger and stronger beak; beak bright red, the tip yellow; cere yellow; feet orange-yellow; irides bright yellow; eyelids pale pink, with orange edges. Female smaller; without the black stripe and rose-red collar. Hab., Andaman Islands. This is another race included by

Mr. Seth-Smith in his "Parrakeets"; he does not say whether it has been imported, but I presume that it has. The wild life would be similar to that of the other races.

Ring-necked Parrakeet of Mauritius (*Palæornis eques*).

Very like the Indian Ring-necked species (*P. torquata*) but larger, of a darker green colour and with broader tail-feathers; upper mandible red, lower mandible reddish-black; feet dark grey; irides yellow; naked orbital skin orange. Female with no bluish tinge on back of head, no mandibular black stripe or rose collar; the black stripe being only indicated by a darker shade of green; central tail-feathers bluer; beak entirely dusky black. Hab., Mauritius.

Russ says of this species ("Handbuch für Vogelliebhaber," p. 208): "Shy, invariably far from human habitations, is gradually becoming extinct. Call-note kikkik repeated four or five times, also melodious whistling. Rare in the trade, is mostly confounded with the little Alexandrine," by which he means *P. torquata*.

Mr. Seth-Smith says that Russ had a specimen which "became extremely tame and affectionate, and learnt to speak well." He probably quotes from Russ's "Talking Parrots," a popular little book which I do not possess.

Indian Ring-necked Parrakeet (*Palæornis torquata*).

The prevailing colour of the cock bird is green, but the back of the head and the central tail-feathers are somewhat bluish; a black line runs from the nostrils to the eye, and a broad stripe runs downwards from the beak and then across the sides of the neck; immediately below this black stripe is a rose-red collar which encircles the neck excepting in front; the breast is tinged with greyish; the under wing-coverts are yellowish-green; the whole of the lateral tail-feathers are yellow on the inner and greenish on the outer web, and all are tipped with yellow; the beak is red with brownish tip, the cere grey, feet ashy, iris of eye pale yellow, with the edges of the eyelids pale orange. The hen differs from the cock in the absence of the black stripes and the rose-red collar, the latter being indistinctly indicated in emerald green. Hab., India, Ceylon, and the Indo-Burmese region as far as Cochin-China.

Jerdon says of this bird ("Birds of India," Vol. I., pp. 258, 259):—"It is one of the most common and familiar birds in India, frequenting cultivated ground and gardens, even in the barest and least wooded parts of the country, and it is habitually found about towns and villages, constantly perching on the house top. It is very destructive to most kinds of grain, as well as to fruit gardens. Burgess says that they carry off the ears of corn to trees to devour at leisure, and I have observed the same sometimes. When the grains are cut and housed, it feeds, on the ground, on the stubble corn field, also on meadows, picking up what seeds it can; and now and then takes long flights, hunting for any tree that may be in fruit, skimming close to and examining every tree; and when it has made a discovery of one in fruit, circling round, and sailing with outspread and down-pointing wings, till it alights on the tree. It associates in flocks of various size, sometimes in vast numbers, and generally many hundreds roost together in some garden or grove."

"It breeds both in holes in trees, and very commonly, in the south of India, about houses, in holes in old buildings, pagodas, tombs, etc. Like the last, it lays four white eggs. Its breeding season is from January to March. Adams states that "he has seen this Parrakeet pillage the nests of the Sand Martin; but with what intent, he does not guess at. Its ordinary flight is rapid, with repeated strokes of the wings, somewhat wavy laterally, or arrowy. It has a harsh cry, which it always repeats when in flight, as well as at other times."

The Ring-neck is generally known amongst soldiers and sailors as the "Green Parrot," under which name I was familiar with it when a child. On account of the facility with which it can be taught to speak, it is a great favourite with the ladies, although it gives them many a headache through its propensity to scream. At times it is imported in such numbers that the market becomes glutted, and specimens can be purchased at absurd prices. I have known it to be offered as low as 5s. per bird. Some specimens have been taught to talk quite well; though, more often than not, their owners have supposed that they could not be instructed to speak distinctly, but only with a nasal twang, the consequence being that the birds always talked as if they belonged to a Punch and Judy show. When nicely instructed, the language is distinctly human, but low-pitched, so that one has to stand near the cage to hear what the bird is saying; there is none of the outspoken clearness which characterises the utterances of the Grey Parrot or any of the talking Amazons.

I have never kept this species myself, though I was once offered a hen in a good cage for 5s.; but a shrieking hen Parrot did not tempt me; had it been a cock bird, I might have closed with the offer.

In *The Avicultural Magazine*, First Series, Vol. VIII., p. 46, Mr. Porter describes his experiences in breeding this species in a lean-to aviary:—A four-and-a-half-gallon barrel was suspended for the nesting-receptacle. In 1900 one young one was reared; in 1901 two were hatched, but one crawled out of the hole and was killed by its fall to the ground, the other was reared. In Germany the species has been bred on several occasions, notably by Mr. Wigand; the young are six weeks in the nest, and then for some time afterwards are fed by their parents. The first example recorded in the London Zoological Society's "List" was deposited at the Gardens in 1862; altogether quite six or seven dozen specimens must have been added to their collection since that date. In 1889 my old friend Col. Charles Swinhoe presented a yellow aberration to them.

African Ring-necked Parrakeet (*Palæornis docilis*).

It differs from *P. torquata* in its shorter wings and smaller beak, the colouring of which is less vivid, more or less suffused with slaty purplish, but it is by no means black, as has been asserted. Von Heuglin describes the beak as crimson, more blackish at the tip; the feet fleshy leaden; the iris rosy yellowish, with similarly-coloured naked circle surrounding the eye. Hab., North of the Equator from Abyssinia to Senegambia.

In its wild state this species lives chiefly in small companies in wooded steppes and on the banks of rivers where there are tall trees. It flies restlessly with much noise from tree to tree, and is very conspicuous wherever it is—restless and very voracious. It devours figs, dates, tamarinds, and other fruits. Its flight is high, rapid, and direct, its long tail held quite horizontally, and the well-known whistle of the old males is abundantly heard, both when leaving and approaching

the trees. The breeding season is from March to June; the careless nests are formed in hollow trees (such as acacias) at a height of from fifteen to thirty feet from the ground, and produce from three to four half-naked young, which are an unusual time in developing.

Capt. Boyd Alexander, writing on the "Birds of the Gold Coast" (*The Ibis*, 1902, p. 370), says:—"We observed it near Busu in December in very large flocks, frequenting the guinea-corn plantations, the corn being then nearly ripe."

At p. 437, the soft parts are thus described from specimens obtained on the White Nile by R. McD. Hawker:—"Iris pale straw-colour; bill red, blackish at tip and on lower mandible; legs and feet grey."

My friend, Mr. James Housden, of Sydenham, had a pair of this species committed to his care by Major, then Lieut. Horsbrugh, and consequently I had an opportunity of examining them. They appeared to me slightly smaller than the Indian bird and somewhat less noisy; the size and colouring of the beak would alone serve to distinguish them at a glance from *P. torquata*, and it is to me surprising that the two should have been confounded. I should describe the upper mandible as crimson, blackish at tip, and more or less suffused with blackish to about the middle (as if the beak had been dipped into an ink-pot so as to dull the crimson on the distal half), the lower mandible also suffused with blackish, but to the base. In fact, the beak is altogether dingier than that of the Indian species.

This species first reached the London Zoological Gardens in 1861.

Blossom-headed Parrakeet (*Palæornis cyanocephala*).

The cock bird, when adult, is of a brilliant green colour, the head having a beautiful peach-like colouring, red, shaded with blue, at the back and the nape of the neck, and less distinctly on the cheeks. There is a black stripe from the lower mandible, which is continued as a collar round the neck, and is followed by a yellowish ring. The lesser wing-coverts are marked with a bright cinnamon reddish patch; the axillaries and under wing-coverts are of a glaucous or verditer blue colour. The two central tail-feathers are blue, tipped with white, and the remainder green, tipped with yellow. The upper mandible is waxy yellow, varying to orange, and the lower mandible black or dusky. The hen has no back collar or red patch on the wing-coverts; the top, back, and sides of the head are lilacine, somewhat browner on the sides, and bounded by a better defined yellow collar. The black collar is wanting. Hab., Himalayas, the northern, western, and southern portion of Central India, and Ceylon.

Mr. Gould says that the Plum or "Blossom-headed" Parrakeet prefers jungly districts to the more open parts of the country, but occurs in all the more richly-wooded, cultivated districts. Its flight is very swift. It breeds in the jungle in holes of trees from December to March, and usually lays four white eggs. The Plum-head is very destructive to grain crops, and my brother found it a perfect pest in his Indian Garden, where a flock would alight upon a row of peas and shell the pods almost as quickly as they could be done by hand: directly they appeared, all available missiles were hurled at them, sometimes more effectively injuring the peas than even the destructive Parrakeets.

Writing on the "Birds of Lucknow" (*The Ibis*, 1903, p. 61), Mr. W. Jesse says:—"It is more abundant in the 'rains,' from which I fancy that it must be locally migratory. I have never taken the eggs, but Reid got four fresh specimens in a pipal-tree on the 15th of April, which averaged .98 in. by .80 in. The cry of this bird is less harsh and far more pleasing than that of *P. torquatus*."

The Blossom-head is one of the best known and most freely imported of all Parrots, and has, at times, been sold at a very cheap rate. It was bred by Dr. Russ in his birdroom in 1872; it first reached the London Zoological Gardens in 1862.

Rose-headed Parrakeet (*Palæornis rosa*).

Both old and young birds are distinguishable at the first glance from the Indian Blossom-head, the male when adult having its head of a pearly rose-colour shading into lavender on the crown, the black colour not succeeded by a blue-green stripe as in the Indian species; the back and under parts are less yellow, the rump bluer; the patch on the wing is browner, and the central tail-feathers are tipped with yellow.

The female has the head more ashy (less blue); the yellow collar indistinct at the sides; the green colour above and below purer, and the wing marked with a red-brown patch as in the male.

The young when they leave the nest nearly resemble the female, but are a little duller; both sexes show the wing-patch distinctly. Hab., "Sikhim, Dacca, Eastern Bengal, Assam, Upper Burmah, and eastwards as far as Cochin China, and Southern China." (Salvadori.)*

In Hume's "Nests and Eggs of Indian Birds," Second Edition, Vol. III., p. 88, we read:—"Writing of the Eastern Rose-headed Paroquet in Pegu, Mr. Oates remarks:—'Nest with four eggs well incubated in a hole of a tree about six feet from the ground. The hole was a foot deep, very roomy, but the entrance, which had been enlarged by the bird, was only large enough to admit its body. The eggs were laid on the bare wood. Although the sitting bird was poked at with a stick, and it took fully half an hour to enlarge the hole in order to take the eggs, yet the bird could not be induced to quit the nest, and eventually had to be dragged out. When disturbed with the stick the female made a noise like the hissing of a snake. These eggs were taken on the 22nd February.

"'On the 22nd March two fresh eggs were taken from another hole, and on the 16th March another nest was found also with two eggs well incubated.

"'The eggs are, of course, pure white, rather glossy when fresh, but becoming dull with incubation. The eggs measure from .97 to .95 in length, and from .85 to .8 in breadth.'" (Salvadori refers this note to *P. rosa*, and probably that is so, though *P. rosa* is quoted as distinct in the same work.)

Hume ("Nests and Eggs," Vol. III., pp. 87, 88) appears to have transposed the two species of Blossom-headed Parrakeets, but the habits of the two are so identical, both at liberty and in captivity, that it is of little consequence.

I purchased two pairs in young plumage about 1893, but I soon discovered that both sexes of one pair had been pinioned, and (before many weeks) these died. The other pair acquired their full adult plumage in the autumn, and in 1894 I was successful in breeding with them, one hen bird leaving the nesting-log and being reared to maturity. It was decidedly larger than its mother, and she, having twisted her tail in the nest when sitting, looked a very inferior bird.

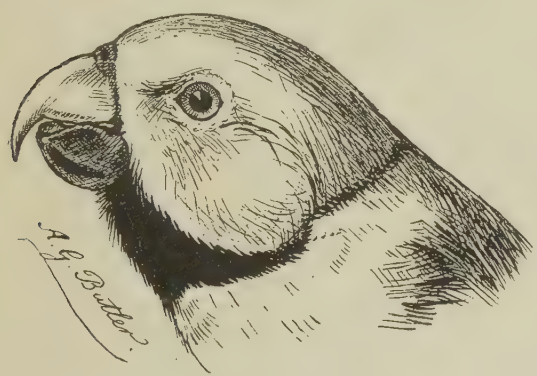
In the following spring the young bird attacked her

* Salvadori gives Southern China on the authority of Consul Swinhoe, but expresses his belief that the two specimens from Chefoo and Canton are both cage-birds, and may have been brought to China.

mother, and I was obliged to remove the latter to a flight-cage to save her life. The father and daughter paired on several occasions, but without result. Now comes the most remarkable fact. The female which I had caged retained its crooked tail until the second moult, and after being two years in a cage it suddenly acquired the perfect colouring of a male bird, shortly after which it died. When opened, the taxidermist assured me that it was a male bird; the ovarium had entirely disappeared with the exception of two fragments on the left side, which had become tightly convoluted so as to present the appearance of male organs, the only irregularity in the appearance being their lateral position.

Had I not known absolutely that it was impossible for me to have made a mistake, the bird having been two years isolated in its female plumage, and at first with the distorted tail acquired during incubation, I should not have hesitated for a moment to accept the verdict of the taxidermist. Doubtless the acquisition of male colouring was due to the decay of the ovarium.

I found these Parrakeets so destructive to other small birds in the aviary with them that I sent them to a



ROSE-HEADED PARRAKEET.

show at the Crystal Palace, pricing them at the cost of the original two pairs of young birds; they were speedily snapped up, and I was not sorry to see the last of them. This species was exhibited at Regent's Park in 1877.

SLATY-HEADED PARRAKEET (*Palæornis schisticeps*).

Green; hind-neck tinged with verdigris; a dark cherry-red patch on median wing-coverts; front edge of wing yellow; primaries with dark green outer webs with narrow yellowish edge, dark grey inner webs; central tail-feathers more or less green at base, blue in the middle, bright yellow on distal half, the other feathers green on outer and yellow on inner webs; head slaty bluish-black; chin, mandibular stripe and a narrow collar at the back of neck, black; under parts paler and more yellowish-green than above; under wing-coverts verdigris; tail below yellow; beak with coral-red upper mandible, the terminal hook and lower mandible yellow; feet dusky green; iris straw-colour; orbital skin slaty. Female without the dark red wing-patch. Hab., North India where, according to Hume, "it is confined to a narrow zone lying between the bases of the sub-Himalayan ranges and the first high snowy ridge."

Of this species Jerdon remarks ("Birds of India," Vol. I., p. 261):—"Adams says: 'Its favourite food is seeds of wheat, apricots and pomegranates; very noisy and gregarious.'"

Hume says ("Nests and Eggs," Vol. III., p. 89):—"The Slaty-headed Paroquet breeds throughout the Himalayas, south of the first Snowy Range, at heights of from 4,000 to 7,000 feet. During the winter they keep much lower down, but about March they begin to come upwards to breed, and the majority lay during the latter half of March and April, though I took one nest of fresh eggs on the 5th of May.

"They nest at times in natural hollows of trees; in fact, this I think is more usual, but not infrequently in holes cut by themselves. The tree in which I have most commonly found them is the hill-oak. The eggs are often very deep down and difficult to secure, especially when, as is often the case, the tree is a sound one. The egg-chamber is at times very large, but is never less than 4 or 5 inches in diameter. They lay from four to five eggs, which are commonly placed on chips of wood; the nest has no other lining. The female sits very close, and will not leave her eggs, though you may be ten minutes hacking away with an axe to get down to the nest."

"The eggs are rather broad ovals, pure white when fresh, and glossless. In size they are intermediate between those of *P. purpureus* and *P. torquatus*. They appear to be often much soiled and stained during incubation, as is not uncommon with those of *P. purpureus*, but which is not common with those of *P torquatus*. In length these eggs vary from 1.08 to 1.17 inch, and in breadth from 0.89 to 0.94 inch; but the average is about 1.12 by 0.92 inch."

The *P. purpureus* of Hume's work is the Indian Blossom-headed Parrakeet.

Russ does not mention *P. schisticeps* in his "Handbook," nor does it appear in the Zoological Society's "List," but Mr. Seth-Smith says ("Parrakeets," p. 107): "It is a very beautiful Parrakeet, but one that is seldom seen alive in England."

BURMESE SLATY-HEADED PARRAKEET (*Palæornis finschi*).

Differs from the preceding in the yellower tint of the green; the bluer head and the more brownish back; the central tail-feathers much narrower; beak with upper mandible orange-vermilion tipped with yellowish; lower mandible pale yellow; feet pale sordid green; irides creamy white or grey with a narrow inner ring of golden yellow; sometimes pale brown, with an outer ring of white. Female smaller and without the dark red wing-patch. Hab., Burmah, and probably northward to Arrakan.

According to Mr. Davison ("Stray Feathers," Vol. VI., p. 119), "It occurs in small parties, frequenting the edges and thinner portions of the forest and the banks of streams. Its voice is very similar to that of *P. schisticeps* of India."

Mr. Davison found it feeding upon large red flowers, but doubtless its general food would be similar to that of other species of *Palæornis*.

Mr. E. W. Harper presented a specimen of this very rare Parrakeet to the London Zoological Society in 1900.

MALABAR PARRAKEET (*Palæornis peristerodes*).

Green, somewhat bluer above than below; the head, neck, upper back, and breast ashy-grey, with the exception of the forehead, which is green edged behind with blue; the lores and a patch encircling the eyes, which are green; from the beak runs a broad black moustachial stripe which joins a black collar bordered behind by

bluish which becomes broader on the throat; upper wing-coverts with pale edges; first primary black, the others blue edged with green; central tail feathers blue, greenish at the base, and tipped with yellowish; next pair blue on the outer web, greenish towards the base; remaining feathers with blue outer and yellow inner webs; all the tips and the under surface yellow; upper mandible red with horn-white point, lower mandible dusky reddish; feet greenish leaden; iris varying from yellow to brown.

Dr. Russ describes the feet as "brownish grey," but he states that the female agrees with the male, whereas Salvadori says that she "wants the bluish-green collar and the green forehead; there is a slight bluish tinge on the lores, and very little green round the eyes. The interscapular region is pale green, like the breast and the abdomen; bill dusky black. Dimensions somewhat smaller than those of the male." The young he describes as follows:—"The grey of the adult bird replaced by green, more or less tinged with blue on the head, especially in the female; both green and black collars are wanting; the black mandibular stripes are slightly indicated." Hab., southern India, from Travancore up to about N. lat. 17 degrees.

Jerdon says of this Parrakeet:—"It, in general, keeps to the depths of the forests, and frequents only the loftiest trees. Its flight is rapid and elegant, and it associates in small flocks. Its cry is mellow, subdued, and agreeable. It feeds chiefly on fruits of various kinds. The young birds are occasionally taken in the Wynaad by some of the jungle races there, and brought for sale to the Neilgherries."

In the second edition of Hume's "Nests and Eggs of Indian Birds," Vol. III., pp. 89, 90, we read:—"Mr. F. Bourdillon informs me that he has taken several nests of this species in the Assamboo Hills, in Travancore. He says: "The first nest we found contained a single fresh egg; this was on the 6th of January. The second (taken on the 20th of January) contained two fresh eggs, while the third, which we found on the 16th of February, yielded four hard-set ones. Probably four is the full complement. The nest is invariably in a hole in a tree, at a considerable height from the ground, and consists merely of a few rotten leaves and a little decayed wood. I have never observed this species either cutting a hole for itself or carrying any material for a nest. The breeding-season seems to last from the 1st of January to the close of March. During April old and young birds are very noisy; the latter learning to fly, the former showing them the way to set about it. The eggs are roundish, white and slightly polished, and the average dimensions of seven were 1.07 inch by 0.88."

Russ says than Von Schlechtendal possessed a small flock of these birds for a long time. Now and again they are malevolent, yet not spitefully snappish towards one another; they have a sharp clattering cry, but not so piercing as that of the Ring-necked Parrakeet. In other respects quiet and peaceful.

After giving the above account of the Malabar Parrakeet, Russ finishes his notes as follows:—"One of the most irritating screamers, not to be scared: a biter."

The two or three examples of this species which I have seen did not strike me as particularly noisy; but, doubtless, with this as with all species, individuals vary.

This Parrakeet was first purchased by the London Zoological Society in 1852, and a fair number of specimens has been added to the collection since that date.

Derbyan Parrakeet (*Palæornis derbyana*).

Green; more yellow on centre of wings; lateral tail-feathers above with a slight bluish tinge on outer webs; four central feathers blue, broadly edged with green towards the base; forehead, lores and a broad moustachial streak velvety-black; front of crown and orbital region verditer green; back of crown and ear-coverts violaceous blue; a narrow vinous line from back of ear-coverts down the side of the neck; the under wing-coverts and under surface to vent similarly coloured; under tail-coverts green narrowly edged with bluish; tail below dull golden-olive; beak black; irides pale straw-colour. Female with the upper mandible red. Hab., "interior of China," probably Hainan.

The type of this rare species was long believed to be unique in the Derby Museum in Liverpool, but in June, 1899, the Hon. Walter Rothschild received two females alive, which he deposited in the Parrot House of the London Zoological Gardens in Regent's Park. Mr. Seth-Smith tells us ("Parrakeets," p. 122) that there "was also a fine pair living in the Berlin Zoological Gardens in 1900."

Banded or Moustache Parrakeet. (*Palæornis fasciata*).

Green; a large yellowish-green patch and a slight tinge of bluish on median wing-coverts; middle tail-feathers blue, edged with green near the base and tipped with yellowish, the others bluish-green; head grey, slightly bluish, lores and orbital region slightly greenish; a band from forehead to eye and a broad stripe from beak to side of neck, black; an emerald green collar on nape to sides of neck; throat, breast, and front of abdomen vinaceous red; hinder abdomen, vent, and under tail-coverts green washed with blue; upper mandible coral red with yellow tip, lower mandible black; feet dusky greenish-yellow; irides pale yellow. Female with more blue on the head, the vinaceous red of the breast extended up the sides of the neck between the blue of the head and the emerald green of the neck; beak black, orange-brown at base of lower mandible. Hab., "Eastern Bengal and along the Himalayas as far as Kumaon, Indo-Burmese Regions, Andaman Islands, Cambodia, Cochin China, Hainan, and, according to Swinhoe, also south of China, near Amoy." (Salvadori.)

Jerdon says of this species ("Birds of India," Vol. I., pp. 268-269): "In some parts of Lower Bengal, as in Gorruckpore and Rungpore, it visits the plains when the rice is ripe, in large flocks. It is brought to Calcutta, caged, in great numbers, from Tipperah, Chittagong, and other places to the East, etc., and is rather a favourite with the natives. Its call is much more agreeable than that of *torquatus* or *Alexandri*. At Thyet-myo in Upper Burmah, in May, I observed large flocks of what I presume was this species, though the only specimens I obtained were in immature plumage. They were feeding on the ground on cow-dung, on the dry bed of the Irrawaddy."

The following account of the nidification by Mr. R. Thompson is quoted in Hume's "Nests and Eggs of Indian Birds," Vol. III., p. 91: "The Madhun Gour Tota breed in the lofty sal forests of the sub-Himalayan range, and are peculiarly restricted to this locality when breeding. Any hole in a tree serves for a nest provided it is near the top of the tree, and the eggs are four in number, pure white, and about the size and shape of those of *P. torquatus*. The breeding-season commences in March, and is carried on till the middle of May, when the young birds leave the nest. Large numbers of them are taken every season when they are yet too young to be able to fly, and carried to the plains, where they are much prized by the natives, learning easily to repeat words and phrases taught them. This Paroquet is generally distributed

DERBYAN PARRAKEETS.

through the dense and lofty forests, but nowhere is it very common."

On the same page we read: "Six eggs vary from 1.12 to 1.18 inch in length, and from 0.94 to 1.0 inch in breadth."

A male obtained at South-west Yunnan by Capt. A. W. S. Wingate (*The Ibis*, 1900, p. 599) is said to have had the iris yellowish-brown; as this species varies in length from 14 to 16 inches, it is quite likely that the colouring of the soft parts may have a local and therefore racial significance.

This is a freely imported and fairly popular bird, yet I have not been able to trace it in Russ's "Handbook," and can only suppose that he confounded it with some other species. I am not aware that it has ever been bred in captivity. It first reached the London Zoological Gardens in 1871, and other specimens have been acquired from time to time since that date.

Javan Parrakeet (*Palæornis alexandri*).

Differs from the preceding in its inferior size; the beak wholly red in both sexes. Hab., Java and South Borneo.

This is practically little more than a race of the preceding species, and does not differ from it in its habits; it is not nearly so often imported; it first reached the Regent's Park Gardens in 1859.

Blyth's Nicobar Parrakeet (*Palæornis caniceps*).

Green, brighter on rump and upper tail-coverts; primaries and their coverts black, the outer webs washed with green and narrowly edged with blue towards base; middle tail-feathers greyish towards the tip, and sometimes with bluish at the base, tip greenish; head grey, passing gradually on the nape into the green at the back; a broad black band from the forehead to the eyes, a broad mandibular stripe, and the chin, black; tail below dull golden; upper mandible red, lower mandible black; feet leaden-green; irides orange-red. Female with the crown and nape bluer and the beak wholly black. Hab., Nicobar Islands.

According to Mr. Davison this species does not associate in flocks, but is found singly or in pairs, occasionally in small parties of five or six. Its note is a loud screech, continually uttered, both when flying and settled, and its food consists largely of the ripe fruit of the pandanus.

Two examples were placed or deposited in the London Zoological Society's Gardens in 1902; but otherwise this Parrakeet seems to be unknown as a cage-bird in this country.

Lucian Parrakeet (*Palæornis modesta*).

Green; upper back pale yellowish-green, more or less washed with bluish; lower back also somewhat bluish; inner webs of flights blackish; central tail-feathers changing to blue towards terminal half, the tips slightly greenish; forehead dark bluish-green shading off into the ordinary green behind; crown dull reddish with a greenish tinge; back of head and nape brighter reddish; loral and mandibular stripes black; cheeks and ear-coverts bright brick-red; fore neck and upper breast pale yellowish-green shading into brighter green on posterior portion of under surface; under surface of flights and under wing-coverts blackish; tail below dull golden olive; upper mandible red tipped with whitish; lower mandible black; feet grey; irides yellow. Female with the crown greenish-brown; frontal margin, lores, and mandibular stripe dark bluish-green; cheeks and ear-coverts reddish, a bluish band margining the latter behind; beak wholly black. Hab., Engano, off the west coast of Sumatra.

Very little seems to be known about this bird; though, according to Mr. Seth-Smith it is a dull and stupid cage-bird. Count Salvadori quotes two examples as having been in the possession of the London Zoological Society, but in the ninth edition of the "List," the species previously recorded as received in 1857 is said to have come from China; so also is the one received in 1884, whereas Count Salvadori enters them in the "Catalogue" as "Indian Archipelago (?)" although he says that Dr. E. Modigliani has quite recently discovered the habitat, previously unknown, of this bird as Engano. Why then not have entered them as "Engano"(?)

Russ says of it: "Recently imported on several occasions," and gives the Moluccas (!) as the habitat.

Nicobar Parrakeet (*Palæornis nicobarica*).

Green; interscapular region pale green washed with bluish; flights blue, edged with green and greenish towards tips; primary-coverts blue; middle tail-feathers blue, edged with green, the others somewhat blue along the centres; lores bluish-black; cheeks and ear-coverts brick-red; mandibular stripe black; nape pale yellowish-green, slightly suffused with lilac behind back of head; fore neck and upper breast yellowish-green, brighter on rest of under surface; tail below golden yellowish; upper mandible vermilion tipped with yellow, lower mandible horny-black, yellowish horn-coloured, or deep dull red; feet dull earthy or brownish-green; irides bright yellow, pale yellow, creamy white, or pale brown; orbital skin greenish-brown or brownish-green. Female with an olive tinge on the crown, the nape and interscapular region without lilac or bluish suffusion; the cheeks of a duller red; the mandibular stripe slightly greenish; beak wholly blackish. Hab., Nicobar Islands.

In Hume's "Nests and Eggs of Indian Birds," Vol. III., pp. 91, 92, we read:—"Mr. Davison remarks: 'On the 17th of February I found on the island of Trinkut, Nicobars, a nest of the Nicobar Paroquet in a hole in a branch of a screw-pine (*Pandanus*), about 12 ft. from the ground; the nest contained two young birds, one well covered with feathers, the other a tiny little thing, with its eyes closed, and without the trace of a feather. There was no lining to the hole, only a little powder from the decayed wood. Again, on the 2nd March, I found a nest, also on the island of Trinkut, situated about 30 ft. above the ground, in a hole in a branch of a large forest tree; this nest contained two very young birds.'

"It is curious that the bills of all the young of these species that I examined were quite red, both upper and lower mandibles; the adult females always have the bills black. Can it be that the bills turn from red in the young females to black in the adult females?" "The young of *P. nicobaricus* and *P. tytleri* that I examined *may* have been all males; but this I think was not likely. I must have seen during my stay at the Andamans and Nicobars at least thirty young birds of these species, of all sexes, either with convicts or in the Nicobarese huts, and yet I never saw a young one that could not fly that had a black upper or lower mandible. The only very young one that I actually dissected was a male."

According to the same writer, quoted in "Stray Feathers," Vol. II., p. 182, "this species is exceedingly abundant on all the islands of the Nicobar group"; he says that they frequent forests, gardens, and the mangrove swamps, generally in small flocks, but occasion-

Barraband Parrakeet.

ally singly, more often in pairs or small parties of four or five when feeding in gardens. "They feed largely on the papaya (*Carica papaya*) and on the ripe pandanus fruit, and I have seen them eating the ripe outer covering of the betel nut (*Areca catechu*), which is so very abundant on some of the Nicobar Islands; but this is evidently not a favourite food with them, and they apparently never touch it when they can obtain better food, as on Camorta."

Russ gives no information respecting this species in his "Handbook." An example was purchased for the London Zoological Gardens in 1873, but it seems to be seldom imported, although Mr. Davison says that they are very easily reared in captivity.

Andaman Parrakeet (*Palæornis tytleri*).

Rather smaller than the preceding, the nape and upper back more suffused with lilac and bluish, the breast also slightly suffused with bluish. Female differing from that sex of *P. nicobarica* in its inferior size and the deep green colour of the mandibular stripe. Hab., Andaman Islands.

Mr. Davison says (cf. Hume's "Nests and Eggs," op. cit.): "On the 17th of April, at Port Monat, Andamans, I saw a female (*P. tytleri*) feeding two young ones that were sitting on the edge of a hole in an old dry mangrove stump about 12 ft. high. As I did not require the birds, I did not climb up to the nest, and so cannot say whether the hole was lined or not."

In its habits this species perfectly agrees with *P. nicobarica*. Mr. Seth-Smith includes *P. tytleri* in his book because he thinks it must have been imported; Russ also includes it, but says nothing about it.

Long-tailed Parrakeet (*Palæornis longicauda*).

The adult male above is green, darker on the lores; the sides of the head and a broad collar across the nape vinous red; broad black mandibular stripes; mantle yellowish shaded with bluish; lower back and rump pale blue; flights blue, tinged at the tips and edged with green; upper tail-coverts and tail green, but the central tail-feathers blue, edged at the base with green; under parts yellowish, the axillaries, under wing-coverts and tail below yellow; upper mandible red, lower mandible brown; feet greyish; iris yellow.

The female is a little darker on the crown; the sides of the head less red, the ear-coverts with a bluish tinge, the mandibular stripes dark green; tail shorter than that of the male; beak horn-brown. The young male is similar, but smaller; the rump bluish and the upper mandible red. Hab., Penang, Malacca, Singapore, Sumatra, Nias, Billiton and Borneo.

The late Consul R. Swinhoe, writing in 1870 of a visit to the market at Canton, says: "Parrakeets with red cheeks (*Palæornis longicauda*?) were in abundance. The dealers told me that they were brought from the western portion of the province, down the west river."

According to Governor Ussher, writing from Labuan: "About April this Parroquet appears to congregate in large numbers, especially the males, uttering loud cries. They then separate, probably for breeding purposes. The males are extremely handsome and swift of flight."

Dr. Russ says: "Much mentioned in the legends and poems of the Malays, described as unnaturally clever; moreover, much caught as an article of food. Not bred hitherto."

It seems a strange thing that a bird so abundant in Malaysia should only come to hand in the European bird-markets occasionally and in single examples.

Two specimens of this species were purchased for the London Zoological Gardens in 1864, and others have been added at intervals from that date. Russ says it is rare, and only imported singly; but, according to Mr. Seth-Smith, some of those which come to hand are advertised by dealers as the much rarer Lucian's Parrakeet.

For the species of *Polytelis* which follow here various foods have been recommended; but Mr. Seth-Smith recommends boiled maize, hemp, and canaryseed as food for them; he also gave ripe fruit daily. This genus is characterised by its weaker beak with the upper mandible not notched.

Barraband's Parrakeet (*Polytelis barrabandi*).

As usual the prevailing colour is green, the adult male with bright yellow forehead, cheeks, and throat; the last mentioned followed by a scarlet crescent; the bastard wing, flights, and tail, dark blue washed with green; thighs usually green, but sometimes red; beak red; feet brown; iris orange-yellow.

The female has the face dull greenish-blue; the chest dull rose-colour; the thighs scarlet; primaries bluish-green; central tail-feathers green; remaining feathers with their inner webs rose-red and their outer webs bluish-green; beak pale reddish-orange; feet, dark brown; iris, brown.

The young male resembles the female. Hab., New South Wales and the interior, to Victoria and South Australia.

Gould appears to have been unacquainted with the wild life of this handsome bird. He says: "Living individuals are frequently brought down to Sydney by the draymen of the Argyle county, where it appears to be a common species." "From the length of its wings and the general contour of its body, we may be assured that its power of flight is very great, and that it doubtless removes from one part of the continent to another whenever nature prompts it so to do."

Campbell says ("Nests and Eggs of Australian Birds," p. 623): "This most elegant and exquisitely coloured species is a somewhat scarce Parrakeet, being limited to isolated localities inland from South Queensland down to South Australia."

"The Barraband Parrakeet, or, as it is called, the 'Green-leek' is well named on account of its general grass-green plumage, the beauty of which is intensified by the forehead, cheeks and throat being of rich gamboge-yellow, and immediately beneath the throat is a conspicuous crescent of scarlet. The female is a little inferior in colouring to the male. Total length of a bird, about 16in. The bird is a striking adornment to an aviary." He thus describes the nidification: "*Nest.*—Within a hole or hollow in a tree, usually by a stream. *Eggs.*—Clutch, four to five; elliptical in shape; texture of shell somewhat fine; surface glossy; colour pure white. Dimensions in inches: 1.17 × .9."

Dr. Russ speaks of this Parrakeet as rare in the market, but says that a German sailor imported twenty examples in 1876. Its behaviour he considers similar to that of a Conure, its climbing superior to that of a Broadtail, though it does not run so speedily on the ground, and cries more shrilly. It can be wintered in an unheated chamber. Up to 1887 it had not been successfully bred, but mules had been reared between it and a female of the Rock-peplar or pebbler or Black-tailed Parrakeet.

In 1900 the Rev. C. D. Farrar successfully bred the species in his aviary, and published an account of his experience in *The Avicultural Magazine*, First Series, Vol. VI., p. 219. He fed his birds entirely on hemp and canary seed.

I was much tempted to buy a handsome pair of this fine species which was offered to me about the year

1897 or 1898, but I had then practically given up keeping Parrots, and therefore resisted the temptation. This species was first exhibited at the London Zoological Gardens in 1867, and others have been received since.

Black-tailed Parrakeet (*Polytelis melanura*).

Upper back olive; scapulars and flights black, the latter with a purplish-blue suffusion on outer web; innermost greater wing-coverts red at tips; innermost secondaries red near tips of outer webs; tail deep purplish-blue; head, neck, shoulders, rump and under surface bright yellow, the head, nape, and upper tail-coverts with an olive tinge; flights below brown; tail below black, with paler tip; beak scarlet; feet ash-grey; irides bright red. Female dull olive-green, darker on back; the rump, breast and abdomen with a yellowish tinge; a greenish yellow patch on the wing-coverts; bastard wing, primary coverts, primaries and some of the secondaries deep blue, with olive outer margins; innermost greater wing-coverts and innermost secondaries red towards the tips; tail bluish-green, black on inner webs and below; three and sometimes all five of the lateral feathers margined on inner webs and tipped with rose-red; under wing-coverts yellowish-olive. Hab., South Australia, from New South Wales to Western Australia.

Gould says ("Handbook to the Birds of Australia," Vol. II., p. 34): "Gilbert remarks that, in Western Australia, it is met with in small families of from nine to twelve in number, feeding on seeds, buds of flowers, and honey gathered from the white gum-tree. Its flight, as indicated by its form, is rapid in the extreme."

A. J. Campbell ("Nests and Eggs of Australian Birds," pp. 625, 626) says: "*Nest.*—Within a hole or hollow of a tree, usually bordering a stream in the interior, or in the crevice of a cliff, notably on the Lower Murray River. *Eggs.*—Clutch, four to six, roundish in shape, texture of shell comparatively fine, surface glossy in some instances, with limy nodules, colour pure white. Dimensions in inches of proper clutches: A (1) 1.26 × .9, (2) 1.24 × .98, (3) 1.2 × .98, (4) 1.19 × .96; B (1) 1.17 × .91, (2) 1.16 × .91, (3) 1.12 × .91, (4) 1.11 × .95, (5) 1.07 × .91."

"The late Captain F. C. Hansen (of the Murray steamer 'Maggie') informed me that he has found the Black-tailed Parrakeet nesting in the Broken Bend cliffs (mallee cliffs) of the River Murray, near Wentworth, also in the cliffs lower down, between Morgan, South Australia, and the border of Victoria. Captain Hansen also states that generally only a pair of young is hatched out of a clutch of four eggs, and that a pair of old birds rears two broods a season in the same nest."

This Parrakeet is fairly well known under the name of "Rock-pebbler." It is not a common species in captivity in this country. Russ states that it has laid eggs on several occasions in confinement, and in 1886 was bred by Mr. B. Christensen, of Copenhagen. In 1903 Mrs. Johnstone bred it at Bury St. Edmunds. Being a rare bird, its price is high. Russ puts it at 60 to 75 marks for a pair. It was first purchased by the London Zoological Society in 1864, and others have since been added.

The genus *Ptistes* is characterised by having its tail-feathers of almost equal length and very broad. According to Mr. Seth-Smith, the one species hitherto imported should have a generous and varied diet—canary hemp, oats, sunflower, boiled maize and ripe fruit, especially apples.

Princess of Wales' Parrakeet (*Spathopterus alexandræ*).*

Differs from *Polytelis barrabandi* in its pale blue forehead and the rosy colour of the lower part of the cheeks, the chin, and throat, which are yellow in that species; the central tail-feathers are also bluish-olive, the two succeeding feathers olive-green on their outer webs and dark brown on the inner ones; the remaining feathers with black centres, the outer parts olive-grey and the inner deep rose-red; the beak is coral red; the feet mealy-brown; iris, orange-yellow. Female smaller and duller, with less rose colour on the throat, and the third primary not spatulate as in the male. Hab., Northern and Central Australia.

Mr. Keartland ("Report of the Horn Expedition to Central Australia," pp. 61, 62) says: "Professor Tate said he had seen a strange-looking Parrot in the oaks near at hand. I started off in the direction indicated, and, after going about two hundred yards, saw what at first appeared to be a Cockatoo-parrot flying towards me. Having carefully noted the branch on which it perched, I hurried forward, but, notwithstanding the sparse foliage of the tree, I had to look carefully for some minutes before I found it. Immediately the shot was fired a number of these beautiful birds flew out of the trees in all directions, in twos, threes and fours. Five birds flew into one tree, but I had to walk round three times before I could see them. At last four heads were visible, just raised from a thick limb, the bodies and tails lying horizontally along the timber.

"I have since heard that one of their breeding places has been discovered on the Hale river. Mr. Charles Pritchard, who accompanied the party as prospector for gold, and assisted me in obtaining my birds, has forwarded to me three eggs out of a clutch of five, which is the usual number. They closely resemble those of *Platycercus eximius* in shape and size, but have a smooth and glossy surface, more like a pigeon's egg. I have since compared them with one laid by Mr. Magarey's bird in captivity, and find they exactly correspond.

"Writing under date 15th November, 1894, Mr. Pritchard says: '*Re* their appearance here. This is the first time on record that they have made this their breeding ground, but I do not think they have come to stay, and perhaps in a year or so they may be as rare as ever. These birds travel in lots from one pair up to nearly any number, are very tame, feeding about in the grass near the camp, and seem in no way afraid of people, cattle or horses. They breed in hollow trees, laying five eggs in a clutch, and several pairs of birds occupy holes in the same tree. They are nesting now in the eucalypts on the banks of the Hale river and other large watercourses. They do not always lie along the limbs, as you found them at Glen Edith, but perch as other Parrots. I have a number in captivity, amongst them being an old male bird with a tail 17in. long.'"

Mr. Fulljames gives an account of a pair which he obtained, in *The Avicultural Magazine*, Vol. V., pp. 168, 169, and he mentions another pair in the Adelaide Zoological Gardens which have nested and produced a pair of young. The cocks of Mr. Fulljames' pair and that in the Adelaide Zoo both died young, and it would appear that the species is by no means a hardy one, though very beautiful. When once established, Mr. Fulljames fed his hen bird upon millet and canary-

* This species has been separated from *Polytelis* as a distinct genus on account of the spatulate third primary in the wing of the male.

seed, but at first he was obliged to give it sponge cake and fruit.

Our Zoological Society received a specimen on deposit in 1895, and a second seems to have been received subsequently, but this Parrakeet is very rarely imported; it is not mentioned in Russ' "Handbook."

Crimson-winged Parrakeet (*Ptistes erythropterus*).

The male has the crown and nape verditer-green; the scapulars and upper back black; the lower back and rump rich blue; the wing-coverts rich crimson; yellow at the base of the feathers; the primaries and inner secondaries dark green, the outer secondaries almost black with green edges, edge of wing green, with a few black feathers below the bend; tail dark green, tipped with yellow, edged with reddish; under parts yellowish-green, the quills and tail below dark brown, the latter with yellowish-green tips to the feathers, reddish at extreme edge; beak orange-scarlet; feet olive-brown, iris varying from scarlet to reddish-orange.

The female is dull green above and yellowish-green below; a few of the wing-coverts red, forming a stripe; rump pale blue, the lateral tail feathers edged with pink to the tips; beak pale horn-colour; iris olive-brown. Hab., Northern and Eastern Australia.

Gould called this a Lory on account of its habits. He says: "The extensive belts of *Acacia Pendula* which diversify the plains of the eastern portion of Australia are tenanted by this bird, either in small companies of six or eight, or in flocks of a much greater number. It is beyond my power to describe the extreme beauty of the appearance of the Red-winged Lory when seen among the silvery branches of the Acacia, particularly when the flocks comprise a large number of adult males, the gorgeous scarlet of whose shoulders offers so striking a contrast to the surrounding objects. It is rather thinly dispersed among the trees skirting the rivers which intersect the Liverpool Plains, but from these towards the interior it increases in number. Being naturally shy and wary, it is much more difficult of approach than the generality of the Parrakeets, and it seldom becomes tame or familiar in captivity.

"Its flight is performed with a motion of the wings totally different from that of any other member of the great family *Psittacidæ* I have seen, and has frequently reminded me of the heavy flapping manner of the Pewit, except that the motion was even slower and more laboured. While on the wing it frequently utters a loud screeching cry.

"Its food consists of berries, the fruit of a species of *Loranthus*, and the pollen of flowers, to which is added a species of scaly bug-like insect, that infests the branches of its favourite trees; and in all probability small caterpillars, for I have found them in the crops of several of the *Platycerci*. It breeds in the holes of the large Eucalypti growing on the banks of rivers; the eggs, which are white, being four or five in number, about an inch and an eighth long by seven-eighths broad."

Mr. North mentions a clutch of eggs taken by Mr. George Barnard from the hollow branch in a lofty Eucalyptus in 1882, which were four in number. He says that the species commences to breed in October, and continues the three following months.

Dr. Russ gives the Blood-wing a better character than Gould does. He says it is graceful and amiable, though, perhaps, somewhat clumsy, enduring, and bears cold without risk. It was first bred in Germany in 1878 by Mr. Seybold, of Münich. The clutch, according to Russ, consists of from two to four eggs; the female incubates alone, twenty-four days; later the male assists in feeding. The young remain in the nest twenty-four days.

In 1899 and 1901 the Rev. C. D. Farrar hatched young of this species in his aviary, but none were reared; but in the latter year Lady Morshead successfully reared three young ones (*The Avicultural Magazine*, First Series, Vol. VIII., p. 34).

Like most Parrakeets, this species is not a safe companion for smaller and weaker birds. In spite of its ugly sound, I am not sure that Blood-winged is not a better name than Crimson-winged for this species, since Gould called it Red-winged, and applied the name Crimson-winged to a smaller race.

This Parrakeet was first exhibited in the London Zoological Society's collection in 1861, and a good many examples have been acquired since that date.

The genus *Aprosmictus* is characterised by its graduated tail, weaker beak, and notched upper mandible. The diet in captivity, according to Mr. Seth-Smith ("Parrakeets," p. 133), should consist of "canaryseed, hemp, oats, millet, sunflower seed, and boiled maize, to which should be added ripe fruit, such as apple, pear, grapes, or banana, and green food, such as chickweed and groundsel."

King Parrakeet (*Aprosmictus cyanopygius*).

In the cock bird the head, neck, and under surface are crimson; the back and wings green, a line bounding the crimson at the back of the neck, and the rump deep blue; a band of pale verdigris-green along the wing-coverts; under wing-coverts green, edged with blue; inner web and under surface of quills black; under tail-coverts crimson, but the base of the feathers dark blue; upper tail-coverts dark olive; tail black, slightly olivaceous above, the outer feathers tinged with blue; beak vermilion, legs brown, iris of eye yellow. The hen has the head, nape, back, and wing green; the throat and chest dull green, tinged with red; the abdomen crimson; the under tail-coverts green, broadly edged with red; the rump blue, with the bases of the feathers green; the upper tail-coverts green; the tail above also green, but the lateral feathers tinged with blue on their outer webs; beak dusky. The young resemble their mother, excepting that their lateral tail feathers have rosy tips; this plumage is retained for the first two years. Hab., Eastern Australia from Port Denison to Victoria.

Mr. Gould says that this bird, which he calls the "King Lory," is "exclusively confined to the brushes, particularly such as are low and humid, and where the large *Casuarinæ* grow in the greatest profusion. All the brushes stretching along the northern and eastern coast appear to be equally favoured with its presence, as it there finds a plentiful supply of food, consisting of seeds and berries." He also observes that at the season when the Indian corn is ripening it is visited by great flocks of this Parrakeet, which cause considerable havoc amongst the crop; as regards its breeding habits he was unable to obtain any particulars. But Mr. North says that it builds in such lofty trees that the nest is very difficult to take.

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," p. 628) thus describes the nidification:—"*Nest.*—Within a hollow limb or trunk of a giant tree (*Eucalypt*), sometimes as far down as the base, in heavy forest country. *Eggs.*—Clutch four to six; roundish in shape; texture of shell coarse; surface slightly glossy, but somewhat rough, being minutely pitted, and with here and there a limy nodule; colour pure white. Dimensions in inches of a clutch: (1) 1.3 by 1.08; (2) 1.27 by 1.11; (3) 1.21 by 1.06."

Dr. Russ describes this bird as abundant in zoological

Masked and King Parrakeets.

institutions, also in bird-rooms; quiet and peaceable, but owing to its sitting so still it is more pleasing on account of its fine colouring than its agreeableness. It is fond of bathing, enduring, and insensible to cold; therefore to be recommended for large aviaries out of doors. Bred by Mr. A. Kohler, of Weissenfels. Several instances have been recorded of the successful breeding of the species in this country also, and if more females were imported, there can be little doubt that successes would be still more frequent.

The London Zoological Society acquired its first specimen of the King Parrakeet in 1859, and has since exhibited a considerable number of both sexes.

In the genus *Pyerhulopsis* the tail is graduated, but the beak is much stronger than in *Apromictus*, and the upper mandible is not notched: the feeding in captivity should be the same as for the King Parrakeet.

Red Shining Parrakeet (*Pyrrhulopsis splendens*).

Prevailing colour above green; a blue band across the nape; primaries and their coverts blue as well as the outermost secondaries, those next to them with a blue tinge along the middle; tail blue, greenish towards base, especially on the central feathers; head and under surface crimson; under wing-coverts bluish green; flights and tail below black; beak and feet black; irides orange. Female smaller, the beak smaller, shorter, less arched, with coarser terminal hook. Hab., "Fiji Islands, Viti Levu, and Kandavu." (Salvadori.)

Speaking of these birds, as observed by him in the Fiji Islands, the late Mr. E. L. Layard says (*The Ibis*, 1876, p. 143): "They frequent the forest, feeding on various fruits and berries as they come into season; and making descents on the planters' Indian corn crops, where their depredations are very serious. They are very shy and wary, planting sentinels, who with harsh cries warn the flock of approaching danger, when off they all troop to the forest, and hide silently in the dense crowns of the broadest-leafed trees. If they find themselves discovered, they utter loud cries, swaying themselves to and fro on their perches, and holding themselves ready for flight in a moment."

In the "Proceedings of the Zoological Society," 1875, p. 425, he says:—"Breeds in holes of trees, and lays two eggs, white, or so much stained as to appear reddish. I am not sure how this stain arises, whether from the parent bird or the bark with which the nest is lined. It occurs also in eggs of *P. personatus* to such an extent that I mistook some eggs sent me for those of *Astur cruentus*, until assured by my correspondent that he had only taken those of the Parrot. Axis 1″, 5‴, diam. 1″ 2‴."

Russ says that Miss Hagenbeck had a specimen of this species which talked well at the "Ornis" Exhibition of 1880: Mr. Bos, of Amsterdam, had a pair which he described as lumpy and clumsy in an aviary, tryannical towards other Parrots; only when isolated in a large open-air aviary did both become tame and the hen laid eggs.

The London Zoological Society has, at various times, acquired a fair number of specimens of this brilliantly coloured Parrakeet; the first specimen was purchased for the Gardens in 1864.

Tabuan Parrakeet (*Pyrrhulopsis tabuensis*).

Chiefly differs from the preceding species in the deep cherry-red or maroon of the head and under parts (Russ calls it purplish brown-red). Female smaller, the beak much shorter and with shorter terminal hook. Hab., Fiji Islands—Vanua Levu, and introduced into Eooa (Tonga Island) from Fiji" (Salvadori); also Tongatabu.

In the "Proceedings of the Zoological Society" for 1876. Mr. E. L. Layard says: "In answer to my inquiries after birds, I was always comforted with, 'Ah! you should get the black Parrot of Eooa!' and I confess my curiosity was greatly excited. However, as I was bound to Eooa on duty, I confidently expected to get it, and charged all my messmates in H.M.S. 'Nymphe' to shoot every Parrot they could see!

"This Eooa (or E-u-a) is a small island to the south of Tongatabu. It appears to me to be a mass of coral, metamorphosed, by the action of volcanic heat under great pressure, into crystallised limestone. It has then been raised to a considerable height (compared with Tongatabu, its near neighbour) above the sea-level, and, having cracked in cooling, is traversed by numerous deep perpendicular fissures. In these flourish a luxuriant tropical vegetation, while the gently rising surface of the island itself is covered with rich grass, on which are depastured some ten or fifteen thousand sheep. As the forest has encroached in places on the pasture-land, the island, viewed from the higher levels, appears like a most beautiful park, and it has the reputation of being the 'loveliest island in the South Seas.'"

"I had to visit one of the stations; so, arming myself with 'Long Tom,' and handing my large double 'Westly Richards' to a native, I sallied out, determined to get a 'black Parrot' if possible. I also specially hired a native to go in search of them, and shoot nothing else.

"In one of the deep fissures I heard the undoubted 'Ka Ka' of a Parrot, that sounded vastly like that of our Fijian bird; so, while I kept watch for a flying shot, I sent the native down the perpendicular sides. Presently I heard below me the loud report of my big 'ten-bore,' followed by the native's shout of triumph; and he shortly reappeared, bringing me my old friend *Platycercus tabuensis*.

"Here, then, was a surprise! the 'black' Parrot turns out a dark maroon; and here, on this speck of land, and *only on it*, appears a Fijian Parrot! The more I think over it, the more I am convinced that the bird has been introduced into Eooa *artificially*. I have already (*The Ibis*, 1876) described the varieties of this species and *Pl. splendens*, Peale. It will be seen that *Pl. tabuensis* and its allies inhabit that part of Fiji to which the Tongans have long years ago had free access. They and the Samoans are specially partial to red feathers for trimming their fans, etc., and for this purpose keep our little *Lorius solitarius* in confinement, plucking it twice a year. I was told they fetched as high as 20 or 30 dollars a pair in Tonga, to which place, and to Samoa, they are conveyed by every canoe or vessel that leaves these islands. What more likely, then, that some Tongan (a chief, probably) took with him the form of *P. tabuensis*, found in Vanua Levu, and either purposely or accidentally let it loose in Eooa? It could never fly thither of its own accord; its powers are too limited, and not one representative of the genus is found elsewhere among the islands. No! it must have been introduced."

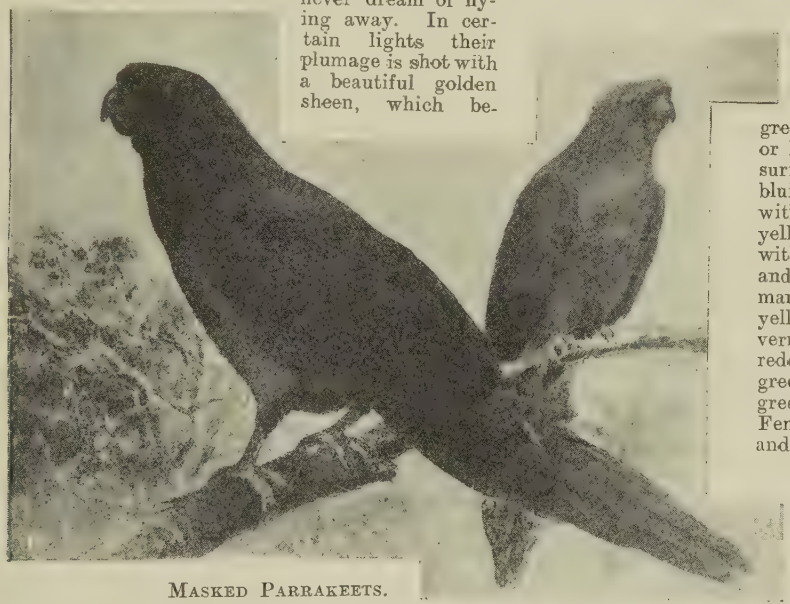
First purchased by the London Zoological Society in 1873; several other specimens have since been added to the collection.

Masked Parrakeet (*Pyrrhulopsis personata*).

The adult male is green, the face black, the primaries and their coverts blue, tail bluish towards the tip, middle of breast yellow, middle of abdomen orange, flights and tail below black, beak black, feet dusky, iris orange-yellow. The female is similar, but smaller,

with a shorter, narrower, and altogether more elegantly formed beak; the young have the beak horn-coloured with yellow edges, the feet black, and the iris dark brown. Hab., Western Fiji Islands.

E. L. Layard says ("Proceedings of the Zoological Society," 1875, p. 426): "This species is characterised by possessing a musky smell, resembling that of a he-goat. I supposed it originated from the trees in the holes of which they breed; but having obtained some very young birds, I noticed they did not smell. Since, however, they have attained their full plumage the odious scent has come to them. They are easily reared, become very tame, and may be trusted with their liberty, foraging for themselves in the forest, and returning to roost to their old nursery. A young lady of my acquaintance has two which thus fly at liberty; and my own birds keep to the house, and never dream of flying away. In certain lights their plumage is shot with a beautiful golden sheen, which be-



Masked Parrakeets.

comes dim in a dead specimen. The iris changes from brown in the nestling to a brick-red with a dash of orange in it in the adult; the bill is dark horn-colour, with a whitish tip; the feet livid black.. In habits they resemble the former species, and keep to the same description of country, forest and wooded river-banks. Breed in holes of trees, and lay two eggs; axis 1″ 6‴, diameter 1″ 3‴. Called 'Vanga' at Bua. (Holmes.)

"The nestling of this Parrot is green above, feathers here and there tipped with white down; black on the face scarcely showing. Body covered with black down, with a row of bright yellow feathers changing into orange on the belly and vent on each side; outside the yellow cere a few green feathers appearing. Bill horn-colour, with the edges, tips, and bases of mandibles orange. Thighs nearly naked. Tarsi livid. Iris brown."

Von Cornely, who, in 1883, had six examples of this species, describes it as vigorous and enduring, not sensitive to cold. It is, however, noted by Russ as rare, and only met with singly in the trade. For many years I used to see a fine example daily outside a house between my own dwelling and the railway station. The London Zoological Society first acquired it in 1862, and must altogether have possessed close on a dozen specimens from first to last. A specimen was exhibited at the Crystal Palace in 1899; as also were specimens of the other two imported species of this genus.

Psittinus is a genus of short-tailed Parrakeets, with moderately swollen beak, the upper mandible notched. Russ recommends as food hemp, canary, millet, and other seeds; boiled rice occasionally, egg-bread, ants' cocoons, and fruit. (I should object to the boiled rice and egg-bread.)

Blue-rumped Parrakeet (*Psittinus incertus*).

Upper back and scapulars olivaceous black; lower back, rump, and upper tail-coverts deep blue; wings green, the front edge yellow; a dark red patch along the lesser coverts; the coverts and the last secondaries edged with greenish-yellow; bastard-wing edged with blue; primary coverts blue; primaries with the inner webs black narrowly edged with yellow; lateral tail-feathers greenish-yellow, central feathers green; head and neck grey more or less tinged with blue; under surface olive-green suffused with bluish-grey; vent green tinged with blue; under tail-coverts yellowish-green, slightly edged with blue; under wing-coverts and axillaries bright red; primaries below black; tail below yellow; upper mandible orange-vermilion, lower mandible dull reddish-brown; feet pale sordid green; eyelids and cere dull green; irides creamy white. Female with the back, rump, and upper tail-coverts green, a small blue patch on lower back; head and nape reddish-brown, sides of head yellowish tinged with reddish-brown and with dusky shafts to the feathers; under surface yellowish-green, the breast-feathers with darker centres; upper mandible dusky white, lower mandible sordid white; feet dull green, as well as cere and eyelids. The beak is also noticeably shorter than in the male. Hab., Tenasserim to Malaysia, Singapore, Sumatra, Bangka, and Borneo.

Mr. W. Davison ("Stray Feathers," Vol. VI., p. 120) observes: "It frequents principally old tounyahs and other places where there is a dense growth of secondary scrub. It feeds chiefly on the small gummy flowers of a plant that always springs up where forest has been felled and burnt. It goes about in small flocks of fifteen or more, and is not at all shy or wild.

"It is migratory in Tenasserim, coming in just before the setting in of the rains, about April and May, though a very few do arrive earlier, about the last week in March. In June and July, I am told, they are very common about Malewoon.

"They have nothing of the harsh screaming notes of the Paroquets, their usual note being a sharp whistle not unlike that of *Cœlornis*; they have also a series of pleasant notes—a warble, in fact—which they chiefly give utterance to when seated.

"It has a rapid flight, and you often see small parties of them (like *Loriculus*) flying about round and round

over the tops of the trees, apparently for fun or exercise, now settling for a moment, then off again, whirling round and round, and all the time whistling at the top of their voices."

According to Dr. Platen (cf. Russ' "Handbuch für Vogelliebhaber," p. 227): "In the vicinity of a stream in Sarawak flights of from 3 to 8 head; breeding-season February to May; nest always in hollows in the highest and most decayed trees; laying 2-3 eggs."

One of the early descriptions and figures of this species was taken by Shaw from a specimen belonging to Lady Bead, which had been kept in a cage in London for nine years. Dr. Russ received a male in 1877 from Messrs. Alpi, of Trieste, and he tells us later that he had two specimens, one of which lived for two years, the other died speedily. In 1878 Mr. Wiener sent an example to Berlin to be exhibited, and later Mr. Abrahams received several specimens.

The London Zoological Society purchased it first in 1866; a second example was added the year following, and two in 1874. One in the Berlin Zoological Gardens lived for three years, and Dr. Russ seems to think that the species cannot be expected to live longer in captivity, in spite of Lady Bead's experience. Now I should put down the early death of the German birds to the egg-food and boiled rice, which I feel sure they would have been better without.

The Love-birds (*Agapornis*) are distinguished by their short rounded tails, with a subterminal black band and the absence of a central ridge along the middle of the underside of the lower mandible. As a rule, they do well upon canary, millet, and oats, but the larger species may have a little hemp occasionally; chickweed, groundsel, and flowering grass may also be given when obtainable, and banana should be offered. They do not care for fruit in captivity as a rule, but they certainly feed upon it when wild.

Madagascar or Grey-headed Lovebird (*Agapornis cana*).

The principal colour is bright but deep green, but the head and breast of the cock bird are of a silvery greyish colour; rump and upper tail-coverts brighter green; flights dull black, with green outer webs; tail with a broad subterminal black band, the lateral feathers yellowish at base; lower breast, abdomen, and under tail-coverts yellowish-green; under wing-coverts black; edge of wing whitish; beak and feet whitish-grey; irides brown. Female practically of a uniform green colour, the grey of head and breast being absent; her beak is also slightly broader than in the male. Hab., Madagascar; introduced into Mauritius, Réunion, Rodriquez, Anjuan, and perhaps Mafia, south of Zanzibar.

The Rev. J. Sibree, jun., writing on the "Birds of Madagascar" (*The Ibis*, 1891, p. 217), says that this "is a lively and brightly-coloured little bird, and is found in considerable numbers, in the outskirts of the woods and near the cultivated districts, all over the island. They go in large flocks, often of as many as a hundred together, and sometimes do considerable damage to the rice crops. They are, however, very excellent eating, and are often snared with a kind of bird-lime." "The two sexes of this Parrakeet show great affection for each other, the pair sitting close together on their perch, from which habit they are often called Love-birds (*Agapornis*).

"One of the native names of this Parrakeet, *Karaoka*, is probably descriptive of its cry; while another, *Masèsy*, means 'degenerated,' or 'become small,' apparently because it is considered a dwarf species of Parrot. This idea also appears in the latter portion of their Hova name *Sàrivàzo* or Sàrivàza, Vàza being a name for the two Parrots also, and probably is identical with the root vàzo, 'loud-voiced,' 'clamorous.'"

Writing of the Comoro Islands ("Three Voyages of a Naturalist," p. 87), Mr. M. J. Nicoll says:—"The grey-headed Love-bird is not uncommon on the cultivated land near the seashore," and at p. 98 he says:—"They were always in pairs, and their flight was wonderfully rapid."

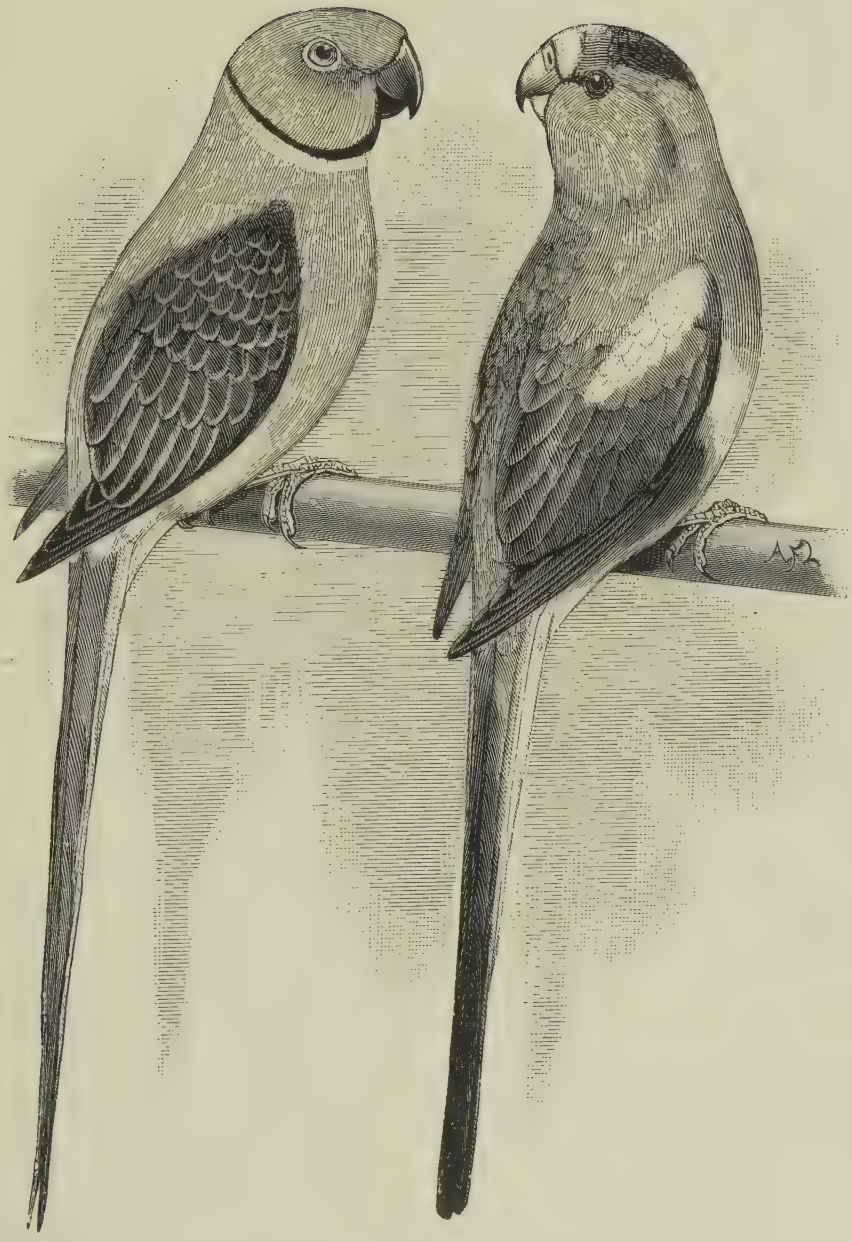
According to the late Mr. Wiener and others who have bred this species, it lines its nesting-hole with shavings of bark or thin splinters of wood, which it carries to the nest stuck between the upper tail-coverts, but Mr. Seth-Smith says "sometimes in their beaks, a mode of conveyance that is probably never adopted in a natural state, in which the material, consisting of pliant strips of green bark, is carried under the feathers of the lower back." My own first pair of this species built in a log and carried all the material in their beaks, but the hen never laid in the nest, but dropped her eggs all over the place.

Just when the cock bird was at its best, at the commencement of the winter of 1891-92, it must have rendered itself objectionable to my Rosella Parrakeet, which promptly killed it; it was a very jealous and irritable little bird, always ready to attack any bird, however large, which showed an interest in its wife. After its death the latter and the Rosella were on excellent terms. She spent much of her time in a log-nest, and he used to look down at her through the entrance hole until she saw fit to take an airing, when he followed her about from one part of the aviary to another, only varying this occupation by hunting the Budgerigars under the mistaken notion that he could catch them.

Madagascar Love-Bird.
(*Head of Male.*)

A male which I had subsequently was so aggressive that I was glad to exchange it for something more amiable.

The Madagascar Love-bird is very spiteful towards any weaker species associated with it (and this seems to be true of Love-birds generally); I had two hens sent to me many years after I had lost my first pair, and finding that they seemed very anxious to breed, I turned them into a section of my toy-aviary (an ornamental thing to stand on the floor of a conservatory) along with a male Blue-winged Parrotlet; unfortunately he took a fancy to the weaker hen and neglected the stronger one; and eventually, in a fit of jealousy, she



Malabar and Many-coloured Parrakeets.

murdered her sister, chewing away one side of her skull; some months later, finding that the Blue-wing was proof against her fascinations, she treated him in like manner, and the following year she died.

As a rule, when caged, grey-headed Love-birds crouch in a corner and utter harsh, scolding notes whenever anyone approaches them, but in 1899 I had the pleasure of seeing a really tame example in the possession of my friend Miss E. E. West.

Of late years this bird has become such a drug in the market that they have been sold as low as about 2s. a pair. The first pair to reach the London Zoological Gardens at Regent's Park was purchased in 1860, and, of course, plenty of examples have been received since that date.

Abyssinian Love-bird (*Agapornis taranta*).

Green, rump and upper tail-coverts brighter; outermost greater wing-coverts black, tipped with green; bastard-wing, primary-coverts, and secondaries black; primaries brown, with a narrow green edging to outer web; tail with a broad subterminal black band; lateral feathers with the inner web yellowish towards the base; front of head, lores, and narrow orbital ring red; under surface bright green; under wing-coverts black; beak red; feet leaden grey, dark brown, or black (according to various authors); irides brown. Female with no red on front of head. Hab., North-eastern Africa, from Abyssinia to Shoa.

Heuglin says ("Ornithologie Nord-Ost Africas," pp. 747, 748):—"It usually lives in families of three to eight individuals, most abundantly in the so-called Woma-Dega (7,000 feet above sea-level), yet it descends to the lowest limits of the Abyssinian olive-tree and the Qolgual Euphorbia, and in Semién and Wogara we still met little parties at 9-10,000 feet altitude.

"The isolated companies lead a tolerably independent life, but keep close together among themselves. They affect the crowns of the higher trees, especially of *Juniperus* and the chandelier Euphorbiæ; at the season of the ripening of the fruits of the Cordias and Sycamores they also settle upon them. The call-note consists of a shrill, at times more chattering, chirp, very like that of *Agapornis pullaria*. The males when in flight often utter a sharp pfiff. The flight itself is usually high, straight and humming; these birds also climb with great facility." Heuglin thinks the pairing season must be at midsummer.

Alfred E. Pease, speaking of the species as observed by him in South Abyssinia (*The Ibis*, 1901, p. 680), says:—"The Red-fronted Parrot was common generally, occurring in twos and fours; its flight was extremely rapid."

In 1908 a dealer at Genoa had several specimens of this Love-bird, a pair of which was presented by a lady friend to the Rev. H. D. Astley.

Red-faced Love-bird (*Agapornis pullaria*).

Bright green, paler below than above; the beak, forehead, front of crown, and cheek are scarlet, the rump bluish, the flight feathers brownish, edged externally with green, the upper tail-coverts green, the tail-feathers with the basal third scarlet, bounded outwardly by a broad black bar, the remainder green, legs grey; the cock differs from the hen in the black coloration of the under surface of its wings, her wings having the under-coverts green; her beak also is less brightly coloured, shorter, more arched, and with shorter terminal hook; her face and rump are paler; she is also smaller. Hab., "Western Africa, from the Gold Coast to the Congo, including the islands of Bight of Benin, ranging eastwards across Equatorial Africa as far as the Gazelle River district and Niam-Niam Country." (Salvadori.)

According to Heuglin, this species flies much in the same manner as *A. taranta*, and has a similar note; he was unable to discover anything definite respecting its habits.

Mr. George L. Bates (*The Ibis*, 1905, p. 89) says: "They resemble miniature Parrots in their tones and actions, as well as in their appearance. They go about in small flocks, making little metallic squeaky cries, which yet have something in them recalling the screams of Parrots. They like open country, and especially the tall grass called 'ukaé,' from which they get their Bulu name of 'Kôs-ukaé' ('Kôs' meaning Parrot); hence they are more common inland, for grass is scarce within a hundred miles of the coast.

"At the back of my house at Efulen was a sort of wild fig-tree, and when its fruit was ripe a flock of these little birds often visited it. Among them were apparently young birds, which would sit on a limb making a great racket and fluttering their wings till the others brought them food."

Mr. F. J. Jackson, describing birds obtained during a journey to the Ruwenzori Range (*The Ibis*, 1906, p. 514) says: "Iris brown; bill salmon-pink; feet light grey. Extremely common here. In passing this shamba I must have seen between twenty and thirty of these birds climbing about the trees amongst the bananas."

The colouring of the soft parts would seem to vary in different localities, since in his expedition to Uganda the same collector obtained specimens which he describes differently (*The Ibis*, 1892, p. 312): "Iris brown; upper mandible yellowish-pink, lower one yellowish-white; feet pale green."

In *The Avicultural Magazine*, Second Series, Vol. II., pp. 350-352, Mr. G. C. Porter published an account of his experience in breeding this species in an outdoor aviary: "They nested in a small box with half a cocoanut husk cemented inside, but any exact details I cannot give. On my return I found two fine young ones, which had been reared, dead on the floor of the aviary. I do not know whether to attribute their deaths to the mice which infest the place or to the excessive heat at the time."

Dr. Russ assures us that it has never yet been successfully bred, and if he has not succeeded, it is a poor look-out for any other aviarist who attempts it. Still, Mr. Porter's experience should encourage one to persevere.

I was never tempted to purchase the Red-headed Love-bird, not only because of its apparent stupidity, but because, when first imported, it is acknowledged to be extremely delicate and liable to collapse. It is also said to be decidedly spiteful towards other specimens of its kind, as well as Passerine Parrakeets and Budgerigars. The partial successes in breeding the species in Germany show that it lays from three to five eggs, which are incubated by the hen alone for twenty-one days; the young in down are scantily covered, white, with pure white beak and feet.

The London Zoological Society acquired its first pair of this species in 1863 and has, of course, had many others since that date.

Rosy-faced Love-bird (*Agapornis roseicollis*).

In its colouring the Rosy or Peach-faced Love-bird is decidedly more pleasing than its red-headed relative. It chiefly differs in its greenish-grey beak, rose-coloured cheeks and chin, the sky-blue colouring of the rump and

upper tail-coverts and the duller-coloured tail, which is reddish, blue, black, and green in bands; the under-surface of the wings is dark grey. The hen differs from the cock in the paler red colouring of the frontal patch, which is also generally rather more restricted; she is a trifle smaller than the male; her beak is shorter, more arched, when viewed from above it forms a short cone as compared with that of her mate. Hab., "South-western Africa, from Angola to Great Namaqua-Land, and, according to Layard, also South-Eastern Africa, on the Limpopo." (Salvadori.)

Messrs. Stark and Sclater say ("Birds of South Africa," Vol. III., pp. 232, 233): "The only notice of the habits of this little Parrot is that of Anderson, which is as follows: 'This species is always observed in small flocks, and seldom far away from water, to which it resorts at least once a day, and is consequently not a bad guide to a thirsty traveller; though if he be inexperienced it would hardly avail him much, as it frequently happens that the drinking places resorted to by this and other water-loving birds are but of small compass and strangely situated.

"'This species is very swift of flight, and the little flocks in which it is observed seem to flash upon the sight as they change their feeding-grounds or pass to and from their drinking-place; their flight, however, is only for a comparatively short distance at a time. They utter rapid and shrill notes when on the wing, or when suddenly disturbed or alarmed. Their food consists of large berries and berry-like seeds.

"'This bird does not make any nest of its own, but takes possession of those belonging to other birds, especially the Social Weaver Bird (*Philetærus socius*) and the White-browed Weaver Bird (*Ploceipasser mahali*). I cannot say whether it forcibly ejects the rightful owners of these nests, or merely occupies such as have been abandoned, but in the case of the first-named species, I have seen the Parrots and Weaver Birds incubating in about equal numbers under the shelter of the same friendly roof. The egg is pure white, not unlike a Woodpecker's, but more elongated.' Examples in the South African Museum measure 0.92 by 0.69."

This species was first bred at the Berlin Aquarium, subsequently by Dr. Russ and various other German aviculturists. Mr. Cocksedge bred eight specimens (*vide The Avicultural Magazine*, Vol. V.). The laying consists of from three to five eggs, which the hen alone incubates, being fed by the cock bird. As a rule three broods are produced, but Russ states that when not prevented six and even seven broods have been produced in succession; if, however, this is permitted, the hen is likely to die. Deserted eggs of this species have been successfully hatched and reared by Budgerigars.

Being tempted by the soft colouring and the hope of breeding a remunerative stock at a time when this species still fetched a high price, I (some years ago) asked Mr. Abrahams to send me a pair. Alas! I soon regretted the action, for not only did both birds spend the whole day in trying to pole-axe their companions with blows of their powerful beaks, but from dawn to sundown they kept up one unending ear-piercing racket resembling the sound of an ungreased trainwheel at express speed. The torture of this intolerable din was so unbearable that friends and neighbours alike began to glare upon me, until at last, after bearing up bravely for several days, I was compelled to throw myself upon the mercy of my friend, who generously took them back.

Some years later I became possessed of two hens, but I am ashamed to say I have forgotten who gave them to me. I put them into a flight-cage, at the back of which was hung up a receptacle of the cigar-box type ("Hints on Cage-Birds," p. 41), in which they deposited several eggs which I discovered too late to preserve them for my collection. I believe I exchanged one of these hens with Mr. Seth-Smith; the other lived until January 28th, 1901.

The first specimen exhibited at the London Zoological Gardens was purchased in 1862, and others were added subsequently.

Black-cheeked Love-bird (*Agapornis nigrigenis*).

Green, flecked with bluish above; upper tail-coverts brighter; front edge of wing yellow; flights dusky, washed with bluish-green on outer webs; tail dark green; all the lateral feathers with a red shaft-stripe and a dusky subterminal spot; hinder half of head and neck washed with olive; front half of forehead and crown sienna-brown; sides of face, including ear-coverts and throat, purplish-black; under surface yellowish-green streaked with yellow on flanks; a patch of salmon-red on lower throat; beak coral-red, nearly white at base; feet flesh-coloured; orbital ring white; irides pale yellowish-hazel. Female slightly smaller and duller in colouring, the forehead and front of crown darker and duller; front edge of wing green; the orbital ring narrower; the beak less suffused at base with white, and not quite so full. Hab., Mugnazi River, North-West Rhodesia.

This species was only described in 1906, and in April, 1908, a small consignment reached the London market by way of Germany. Others must have come to hand subsequently, judging by the number shortly afterwards in the possession of various aviculturists. On January 23rd, 1909, Mr. Babb brought a pair round to my house in order to get my opinion as to whether they actually were of opposite sex. This I had no hesitation in deciding to be the case, judging from the differences indicated in the preceding description.

In *The Avicultural Magazine* for Oct., 1908 (Second Series, Vol. VI., pp. 317-329), Messrs. H. D. Astley and Reginald Phillipps published accounts of the species, illustrated by a most characteristic coloured plate of the two sexes. Mr. Phillipps described his success in breeding the species in his bird room, which opens into one of his garden aviaries. The birds went to nest in June, carrying chips of dead poplar, hay, wheat stalks, spray millet stalks, and sticks, in their beaks, to the log in which they proposed to lay. The first egg was believed to have been laid on June 20, and by the 23rd there were two eggs in the nest. They were, as usual, white, but of a much elongated pear shape (unlike the eggs of *A. cana*, *A. pullaria*, and *A. roseicollis*). In all four eggs were laid and the young reared, the first bird leaving the nest on Aug. 22 (see continuation of Mr. Phillipps' article (Vol. VII., pp. 31-36). On Aug. 30 apparently the first egg of a second clutch was laid.

From what Mr. Phillipps observed, the female seems to incubate alone, the male not feeding her, so far as he could ascertain, until after the young were hatched. Those who desire more information respecting this beautiful species should read through the whole of Mr. Phillipps' very interesting article.

The next birds to be considered are the Hanging Parrakeets (*Loriculus*); quaint little creatures, which always sleep suspended head downwards from a branch or perch. They are characterised by their somewhat slender beaks, the upper mandible of which is long and not much curved. In their wild state the Hanging Parrakeets feed upon honey and fruit; therefore in

captivity they should be fed like the Lories and Lorikeets.

At one time these birds were supposed to be related to the Lories, but the absence of fringes or brushes to the tongue at once distinguishes them.

The species of this genus range from India and the Philippines, through the Malay Archipelago, eastward to Duke of York Island and the Papuan sub-region.

Vernal Hanging Parrakeet (*Loriculus vernalis*).

Green, slightly tinged with orange on upper back; rump and upper tail-coverts red; flights verditer-blue on inner webs; head brighter green; a bluish patch on the throat; upper breast with a yellowish tinge; beak dull coral-red, tipped with yellow; cere red; feet pale orange; claws pinkish horn-coloured; eyelids yellowish; irides pale yellowish-white. Female of a yellower green than the male, the head not so bright, the blue of the throat nearly or quite absent. Hab., "India, and from Sikhim through the Indo-Burmese countries to the Malay Peninsula, Andaman, and perhaps also the Nicobar Islands." (Salvadori.)

Jerdon says ("Birds of India," Vol. I., pp. 265, 266): "I have found this species in open spaces of the forests in Malabar, occasionally coming into well-wooded gardens near the coast. It is most numerous in Travancore and South Malabar, becoming rarer towards the north. Mr. Elliot, however, mentions it as visiting Dharwar, above the Ghats, during the rains only. It is found in small flocks, and keeps up a continual chirping when feeding, which it does on fruit and flower buds, partly probably for the nectar contained in the latter. It is said to be fond of the toddy of the cocoanut palm, and to be sometimes taken stupified at the toddy-pots; and I have had them brought me alive at Tellicherry, said to have been taken in that situation."

I quote the following from Hume's "Nests and Eggs of Indian Birds," Second Edition, Vol. III., pp. 92-93:—"Mr. Davison says: 'On April 19, while returning to Ross from Port Mouat, a Burman convict, who was with me, saw a bird of this species fly into a hole in the branch of a forest tree growing by the road side. He called my attention to this, and I sent him up the tree. On his climbing up he found the bird (which he caught and brought down with him) sitting on three round white eggs. The hole was about 20 ft. from the ground, and contained no lining or attempt at a nest, the eggs being laid on some soft, black earthy-looking powder that lay at the bottom of the hole, and which had evidently fallen from the top and sides of the hole. The hole, which was a natural one (not excavated by the bird), was moderately large, but not quite large enough to admit the convict's hand without a little cutting away at its lower edge.'

"The eggs above referred to are very broad and obtuse-ended ovals, in colour dirty white, and entirely glossless. They vary from 0.7 to 0.75 in. in length, and from 0.58 to 0.6 in. in breadth."

According to Hume, this species "lays from three to five eggs, from March to May, in holes and hollows of trees, without any nest."

"Mr. J. Inglis, writing of this species in Cachar, says: 'The Indian Loriquet is rather common; it breeds on the hills about April. It is often found sucking honey from a large red flower in March, when as many as four or five can sometimes be killed at a shot. It flies at a great pace, but is not in the least shy.'"

Russ says that this bird "sings charmingly; call note like *tsookitt*, also gentle whispering like the whispering of mice; flight easy and noiseless; it loves fresh twigs, but not from thorn trees; not delicate; keeps sprightly and tight in feather in an unheated room in the cool days of spring."

The Vernal Hanging Parrakeet is rarely imported, and is not mentioned in the ninth edition of the London Zoological Society's list.

Russ says that in 1873 he received a male of *L. pusillus*, which unfortunately died soon afterwards. It comes from Java.

Golden-backed Hanging Parrakeet. (*Loriculus chrysonotus*).

Green; nape and upper back golden-yellow, the former with an orange spot in the middle, and the latter tinged with orange; sides of lower back tinged with blue; rump and upper tail-coverts red; flights and tail above dark green, the former with blue inner webs, the latter with pale tip; forehead red; remainder of crown golden-yellow; sides of head and neck grass-green; a large orange-red patch on the throat; tail below blue, with pale-green tip; beak orange-red; feet orange; irides brown. Female smaller, with a blue tinge on front of cheeks and throat, no red patch on the latter; the yellow on head and nape less bright; the blue on sides of lower back paler; her beak is also longer, more arched, and rather broader at base. Hab., Cebu, Philippine Islands.

I have not come across any field notes dealing with this species. A pair was purchased by the London Zoological Society in April, 1871, and these went to nest and hatched a young one on Aug. 23 following; but no details are given in the Society's Proceedings. Another specimen was purchased in the year following from Dr. Meyer, who states that numbers are taken by the natives from the nest and reared.

Ceylonese Hanging Parrakeet (*Loriculus indicus*).

The general colouring of both sexes is green, paler below than above, the crown, rump, and upper tail-coverts red, the nape and mantle washed with orange; lores, cheeks, chin, and throat bluish, inner webs of flights and under surface of tail greenish blue; beak orange-red, the tip and lower mandible paler; cere yellow; feet dull yellow; iris white. The female is smaller than the male, and her beak is shorter, more arched, and broader at base. Hab., Ceylon.

In the young the forehead is greenish grey, shading into orange behind, mantle almost pure green, cheeks without bluish tinge, throat very slightly bluish.

Colonel Legge says of this bird: "The Ceylon Lorikeet frequents woods, detached groves of trees, compounds, native gardens, patnas dotted with timber; and, in fact, any locality which is clothed with fruit-bearing trees or those whose flowers afford it its favourite saccharine food. It is a most gluttonous little bird, constantly on the wing in active search for its food, darting with a very swift flight through the woods, uttering its sibilant little scream, its bright plumage flashing in the rays of the tropical sun. When it reaches a tree which attracts its attention it instantly checks its headlong progress, and, alighting on the top, actively climbs to the fruit which it has espied, or, should the tree prove barren, after giving out its call-note for a short time, darts off, perhaps in the opposite direction from which it came. It is excessively fond of the 'toddy' or juice which exists in the Kitool or sugar-palm (*Caryota urens*), and feeds on it to such an extent that it becomes stupefied and falls an easy captive to the natives, who cage it in large numbers for sale at Point de Galle.

"While in a state of captivity they are fed on sugar-cane, of which they are very fond, but they do not live for any length of time should the supply of cane come to an end. It feeds so gluttonously on the beautiful fruit of the Jambu tree, that I have seen bird after bird shot out of one tree without their companions taking the slightest notice of the gun or the death of so many of their little flock. When held up by the legs, after being shot, the juice of this fruit pours from their mouths and nostrils. The flowers of the cocoanut tree come in for a large share of its patronage, so do also those of other trees, on the 'cups' or calyces of which it subsists, biting them off in a pendent attitude. Layard writes that 'at Gillimally they were in such abundance that the flowering trees were literally alive with them. They clung to the bright scarlet flowers head downwards, or scrambled from branch to branch, while the forest echoed with their bickerings. They bit off the leaves (which fell like scarlet snow upon the ground) to get at the calyx, and when this dainty morsel was devoured they flew off to the banana trees, down the broad leaves of which they slid, and fastened upon the ripening clusters of fruit or the pendent heart-shaped flower.'"

Mr. F. Lewis (*The Ibis*, 1898, p. 346) says: "I am inclined to consider that this species should be regarded as more abundant in the intermediate districts between the wet and dry zones, as it is certainly to be found in greater numbers in that limit than in the extremes. It often ascends up to the highest hills, but is then only an occasional visitor. It breeds in high trees, but I have never succeeded in procuring the eggs.

"In Colombo it may be frequently found for sale, and is known as the 'Love-bird.'"

This is the most frequently imported of the Hanging Parrakeets, but nevertheless is rare in the market, and consequently expensive. Our Zoological Gardens have at various times exhibited specimens, the first pair being purchased in 1872.

Dr. Russ states that a pair of this pretty species in the possession of Mr. Blaauw was kept in good health and plumage in a room only slightly warmed in the day-time. They ate nothing but canaryseed and rather stale, moistened, but well-pressed-out white bread.

Blue-crowned Hanging Parrakeet (*Loriculus galgulus*).

Green; a triangular golden yellow spot on upper back; a bright yellow belt across lower back; rump and upper tail-coverts scarlet; tail with yellowish green tip; a dark blue spot on middle of crown; a large scarlet patch on throat; greater under wing-coverts, inner web of flights below, and tail below verditer-blue; beak and cere black; feet grey or buffish brown; irides dark brown. Female noticeably duller, with no scarlet on throat or yellow belt across lower back; the beak broader, rather shorter and more arched. Hab., Wellesley Province to Singapore, Sumatra, Nias, Bangka, and Borneo.

Mr. F. Nicholson (*The Ibis*, 1888, p. 239) says that in Sumatra this species is met with "in villages on cocoanut trees, and kept by natives in cages."

Mr. C. Hose says (*The Ibis*, 1893, p. 416): "This little Lorikeet is found on all cleared land, and ascends Mount Dulit to 2,000 ft. It is caught by the natives in large numbers. Native name, 'Entalit.'"

This is a species tolerably well known to bird-keepers, and has been exhibited from time to time. Russ says that, according to F. T. Salva, it does great mischief in Borneo to the sugar-cane plantations, sugar-cane being a favourite food. Its song, according to Dr. Frenzel, is a true melody similar to that of the Red-rumped and Plain-headed Parrakeets, late in the evening and early in the morning. Call-note, zizizizi.

The London Zoological Society first purchased a pair

Blue-crowned Hanging Parrots.

in 1869; in 1873 five were added to the collection, and in 1875 two more. Others have been received since that date, the last recorded in the ninth edition of the "List of Animals" being three presented in 1889.

Sclater's Hanging Parrakeet (*Loriculus sclateri*).

Green, flights and tail darker, the former with black inner webs above, the latter with pale tip; a large orange-yellow patch, becoming orange-vermilion in the

centre, on the upper back; rump and upper tail-coverts bright red, as well as front edge of wing; feathers of forehead red-brownish at base; a red patch on the throat; flights below with blue inner webs; tail below blue; beak black; the base of upper mandible and cere yellow; feet yellow; irides yellow. Female apparently differing in having the red throat-patch narrower, forming a longitudinal streak, sometimes orange-red. Hab., Sula Islands.

I have discovered no account of the wild life. An example was purchased by the London Zoological Society in 1865, and no other seems to have come since; it is, therefore, perhaps hardly more worth mentioning than Russ' alleged example of *L. pusillus*, excepting that its identification is certain. It seems, from a note in Salvadori's "Catalogue of the Parrots," that the late George Gray mistook a young example of *L. galgulus* for *L. pusillus*, and Russ may have done the same for all we know to the contrary.

This concludes the present sub-family, and now we pass on to the extremely popular Parrakeets of the sub-family *Platycercinæ*.

CHAPTER XIV.

SUB-FAMILY PLATYCERCINÆ.

(Broadtails, Horned Parrakeets and many others).

This group is characterised by a short, thick beak, the upper mandible of which is usually swollen at the sides and the lower mandible hidden by the feathers of the cheeks; the cere is small, only surrounding the nostrils and forming a sort of saddle over the culmen; tail rather long; wings pointed; some of the outermost primaries narrowed towards the tips.

In the Broadtails (*Platycercus*) the beak is distinctly notched, and the feathers of the tail are broad and not pointed at the tips. The species of this genus range over Australia, Tasmania, and Norfolk Island, and are mostly very brilliantly coloured, with the feathers of the back black with broad borders, which gives them a scale-like appearance. They feed in their wild state upon seeds, berries, and sometimes insects and their larvæ. Their food in captivity should consist, according to Mr. Seth-Smith ("Parrakeets," p. 158), "of canaryseed, hemp, oats and dari, pea-nuts, and fruit, or green food, such as chickweed, groundsel, or flowering grass. Some are fond of insects, and mealworms may be given occasionally, especially towards the nesting season." The sexes are much alike in pattern and colouring, but the females are generally slightly smaller, duller, and with less swollen upper mandible.

Masters' Parrakeet (*Platycercus mastersianus*)

is doubtless a variety of Pennant's Parrakeet

Pennant's Parrakeet (*Platycercus elegans*).

The adult male has the head, neck, under surface, rump, and upper tail coverts rich crimson; the feathers of the back and scapularies black, broadly margined with crimson; cheeks and shoulders blue; greater wing coverts pale blue; primaries and secondaries black, with the basal half of their outer webs deep blue; the four centre tail feathers bluish green, shading into blue on their margins and tips; remainder of tail feathers black on the inner webs for three-quarters of their length, deep blue on the outer webs for nearly the same length, and largely tipped with pale blue on both sides; beak, horn-coloured; legs, blackish brown; iris of eye, dark brown.

The female very closely resembles the male, but the crimson of the upper parts and head is less vivid and the tail greener. The entire bird is slightly smaller, and its head is a trifle rounder; her beak is not so much swollen in the middle. Hab., Eastern and Southern Australia; especially common in New South Wales; probably introduced into Norfolk Island.

This bird, according to Gould, is found on grassy hills and in bushes, especially of the Liverpool range and similar districts; its natural food consists of berries, grass seeds, and sometimes insects and caterpillars, to obtain which it descends to the bases of the hills and open glades. It runs rapidly over the ground, but its flight is not enduring; it breeds in holes in the large gum trees, especially those on hillsides within brushwood, the cedar brushes appearing to be its favourites. Its breeding season extends from September to November; it lays from four to seven white eggs on the rotten wood at the bottom of the holes. The song of this species is said to be not unpleasant, though at times it is a little given to screaming in a mild way. It is tolerably peaceable, tractable, and quite capable of being bred in a good-sized aviary; in fact, there are not a few cases on record of its having been reared in confinement; indeed, Dr. Russ says that it has often been bred, but that it rarely rears its young satisfactorily. It is an absolutely hardy bird, quite capable of resisting the cold of our severest winters in an outdoor aviary. When breeding, this and all the *Platycerci* should have an aviary to themselves—that is to say, to each pair of birds.

The Pennant's Parrakeet is tolerably freely imported and not excessively dear; the first pair to reach the London Zoological Gardens was presented in 1861, since which date many others have been added to the collection at Regent's Park.

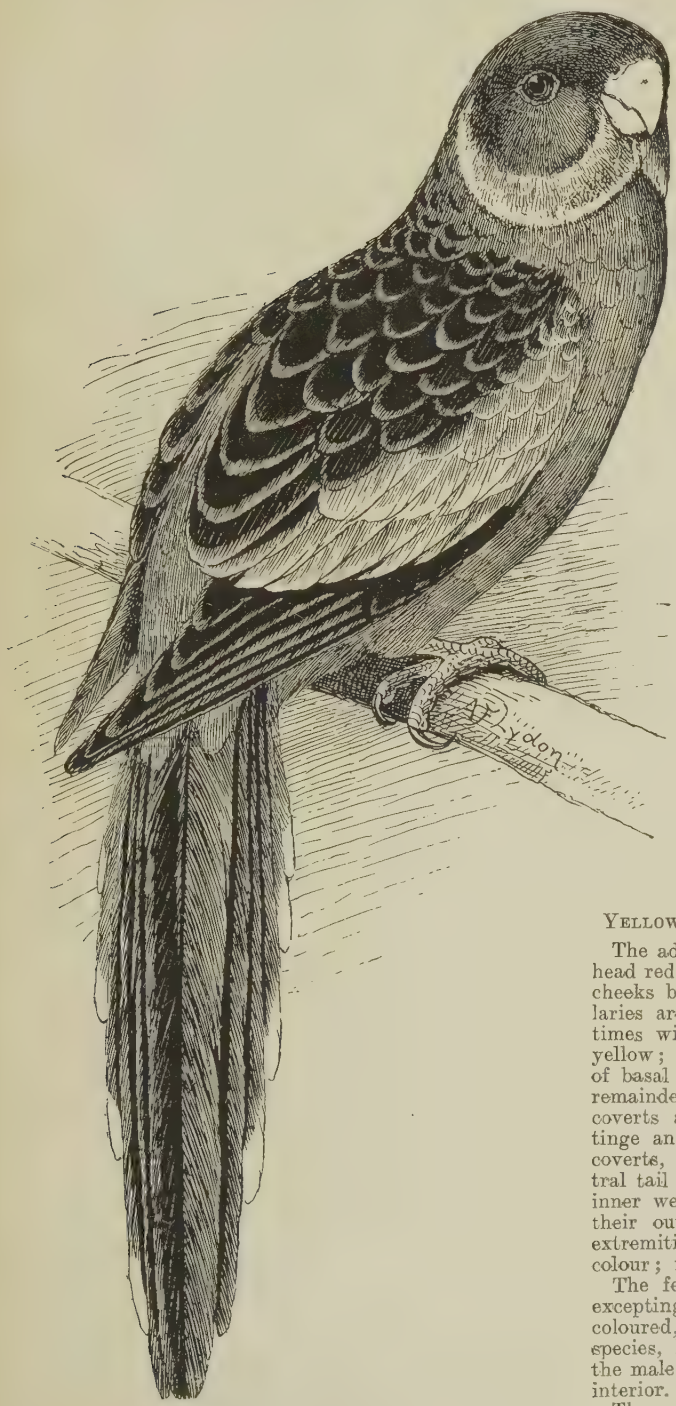
Adelaide Parrakeet (*Platycercus adelaidæ*).

Differs from the preceding species in the brick or orange-red colouring mixed with yellowish, in place of the crimson of Pennant's Parrakeet; the black feathers of the back and those of the under parts with yellowish or buffish edges, as also the red feathers of the rump and upper tail-coverts; the blue of the cheeks rather paler, and the centre tail feathers decidedly green, slightly washed with blue. The sexes differ exactly as in *P. elegans*. Hab., Southern Australia and the interior of the Continent.

Mr. Gould says of this species :—"The *Platycercus adelaidensis* at first caused me considerable perplexity from its close similarity in some stages of its plumage to the *P. pennantii;* as in that species the plumage of the young for the first season is wholly green, which colouring gradually gives place to pale orange-red on the head, rump, and upper surface, the scapularies and back feathers being margined with the same, but which soon disappears, and gives place to dull yellow on the flanks and olive-yellow on the upper surface, the scapularies and back feathers in the mature dress being edged with yellowish-buff and violet. It was only by killing numerous examples in all their various stages of plumage, from the nestling to the adult, that I was enabled to determine the fact of its being a distinct species.

"When I visited the interior of South Australia in the winter of 1838 I found the adults associated in small groups of from six to twenty in number; while near the coast, between Holdfast Bay and the Port of

Adelaide, the young in the green dress were assembled in flocks of hundreds; they were generally on the ground in search of grass seeds, and when so occupied would admit of a near approach; when flushed they merely flew up to the branches of the nearest tree. It is impossible to conceive anything more beautiful than the rising of a flock of newly-moulted adults of this species, for their beautiful broad blue tails and wings glittering in the sun present a really magnificent spectacle."



Pennant's Parrakeet.

Dr. Russ says of this bird: "Entire nature corresponding with that of the preceding species, for the most part not distinguished at all by aviculturists and dealers." And as Dr. Russ tells us that the price of the two birds is the same (in Germany, at any rate), I suspect that to this day the smaller and less experienced of English dealers sell the Adelaide Parrakeet as the female of the Pennant. Of course, if one possesses a male Pennant and a female Adelaide (or *vice versâ*) they may be expected to interbreed under favourable circumstances; for, after all, they are but geographical races, though easily separable by their colouring. It is also quite possible that the result of such a cross would not be an admixture of colouring, but as with the varietal forms of the Gouldian Finch, when interbred, would reproduce the male colouring in the young males and the female colouring in the young females, or the reverse, as happened when I paired male *P. gouldiæ* with female *P. mirabilis*. The natural effect of such a result upon the owner would be to render him obstinate in upholding the dealer's statement that the brick-red bird was the female of the crimson bird, and not a distinct species or geographical form, but in all these matters it is far better to sift your facts to the bottom before making positive assertions. It is unpleasant to know yourself wrong, and trying to some men to own it."

An example of this bird was deposited at the London Zoological Gardens in 1863; few specimens have found their way to Regent's Park, however.

Yellow-rumped Parrakeet (*Platycercus flaveolus*).

The adult male has the head yellowish with the forehead red, the lores and throat washed with red, and the cheeks blue; the feathers of the back and the scapularies are black edged with pale yellowish and sometimes with a bluish tinge between the black and the yellow; wings blue, the bastard wing and outer web of basal portion of the primaries deep violet blue, the remainder of the primaries deep brown; inner wing-coverts and inner secondaries black with slight blue tinge and edged with pale yellow; rump, upper tail-coverts, and entire under surface pale yellowish; central tail feathers blue, the second pair blue with black inner webs; the remainder more or less deep blue on their outer webs, becoming pale blue towards their extremities and white at the tips; beak, pale horn colour; feet, dark brown; iris, brown.

The female is slightly smaller than the male, but, excepting that she is a trifle duller, is very similarly coloured, it is probable that, as with the preceding species, her beak is less swollen at the sides than in the male. Hab., Victoria to New South Wales and the interior.

The young are greener than the adults with narrower

red frontal band, upper parts more olive in tint, the rump and upper tail-coverts yellowish-olive; inner wing-coverts and inner secondaries olive, as also the central tail feathers; a white band on the quills below.

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," p. 632) thus describes the nidification :—"*Nest.*—Within a hollow branch or bole of a tree, usually a red-gum (*Eucalyptus rostrata*), growing on a flat or bordering a stream. *Eggs.*—Clutch, four to five; round oval in shape; texture of shell fine; surface slightly glossy; colour, pure white. Dimensions in inches of a proper clutch (1) 1.16 × .93, (2) 1.16 × .92, (3) 1.12 × .93, (4) 1.10 × .92."

"In the Moulamein district of Riverina, Mr. J. Gabriel and myself found the Yellow Parrakeet numerous, especially in the timber bordering streams, and not infrequently visiting the gardens of selectors and others.

"The birds were then (September, 1894) pairing, or had paired, but we were unable to discover in the numerous red-gums on the flat, or along the watercourse, the eggs, which were new to science. However, Mr. W. White, with a relative, who happened to be out collecting during the same month in the Flinders Range, South Australia, kindly forwarded me a set of four eggs, which specimens are herein described. They were taken on September 20th, 1894, from a hole under an elbow of a large red-gum (*Eucalyptus*) growing in a grassy vale in the Warrabra Forest, which is 200 odd miles north of Adelaide."

Two examples of this species were purchased by the London Zoological Society in May, 1867, but it is a rarely imported species, and, to my mind, by no means a tastefully coloured one; a single young one was bred by Mr. Wm. R. Fasey in 1904.

Yellow-bellied Parrakeet (*Platycercus flaviventris*).

In this bird the forehead is crimson; the crown of the head and back of the neck pale yellow, each feather thinly edged with brown; below the eye is a patch of dull crimson; the cheeks are blue; the back and shoulders olivaceous black, each feather having a green margin; the middle of the wing is blue, the basal half of the primaries with blue outer edges, the remainder being blackish-brown; the rump and two central tail-feathers green, the remainder dark blue at the base, lighter towards the tips; under surface of body yellow; beak flesh-coloured; legs greyish-brown. The female is duller and greener; her beak is less swollen at the sides. Hab., Tasmania, South Australia, and the islands of Bass' Straits.

According to Gould, this fine species "frequents every variety of situation, from the low-crowned hills and gullies in the depths of the forest to the open cleared lands and gardens of the settlers. It runs over the ground with great facility, and when observed in small flocks searching for seeds among the tall grass, few birds are seen to greater advantage." He then continues thus: "I found this species very abundant on the banks of the Tamar, and in one instance I saw hundreds congregated at a barndoor among the straw of some recently threshed corn, precisely after the manner of Pigeons and Sparrows in England." The food of this Parrakeet when wild consists of various grass-seeds and the flowers of *Eucalypti*; it nests from September to December in holes in the branches of large gum trees, and lays from six to eight white eggs.

This species seems to be extremely rarely imported; it was, however, bred by Baron von Cornely in 1882. An example was purchased for the London Zoological Gardens in 1860, and a second in 1875; but it seems to be sent home singly and at long intervals. Mr. Seth-Smith says he has never seen it offered for sale.

Mealy Rosella (*Platycercus pallidiceps*).

In this species the crown of the head is either wholly white or pale gamboge-yellow; in some examples the front of the forehead is crossed by a fine line of crimson; the lower parts of the cheeks are deep blue; the feathers of the nape, scapularies, and back are black, broadly bordered with gamboge-yellow; the rump is greenish-blue, varying in some specimens to gamboge-yellow; the primaries and secondaries are blackish-brown, the base of the outer webs being deep blue; the greater and lesser wing-coverts and shoulders above and below bright blue; that part of the wing nearest the body black; under surface greenish blue, excepting the under tail-coverts, which are crimson; the two middle tail feathers greenish-blue; the basal half of the remaining tail feathers blackish-brown on the inner, and deep blue on the outer webs; the terminal half pale blue, fading into white at the tips; beak horn-coloured; legs dark brown; iris of eye blackish-brown. Female apparently smaller, duller in colouring, and with the upper mandible less swollen at the sides. Hab., Queensland and New South Wales.

A. J. Campbell ("Nests and Eggs of Australian Birds," p. 634) describes the nidification of the Pale-headed or Mealy Rosella as follows :—"*Nest.*—Within a hole in a tree. *Eggs.*—Clutch, four to five; nearly round or round oval in shape; texture of shell somewhat fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch (1) 1.03 × .88, (2) 1.04 × .89, (3) 1.02 × .87, (4) 1.02 × .84."

"The eggs of the Pale-headed Parrakeet in my collection bear the data, Coomooboolaroo (Queensland), etc., where I had the pleasure of observing the birds in a state of nature, and procuring skins.

"Usual breeding season, September to December, but at Coomooboolaroo the birds have been observed laying in March and July, but generally in October."

Russ states that, in captivity, this species behaves like the common Rosella; it has been bred several times, and is almost as common in the market as the ordinary Rosella. Price 20 to 30 marks for a pair. On the other hand, Mr. Seth-Smith says ("Parrakeets," p. 165): "It is well known to aviculturists in this country, although not nearly so often to be obtained as its commoner relative, *P. eximius*. It was bred by Mr. C. P. Arthur, the hen laying four eggs, of which two got broken; the other two were hatched and reared; these two birds appeared to be sexes, and differed when they left the nest in the colouring of the under tail-coverts—scarlet in one, faint orange in the other.

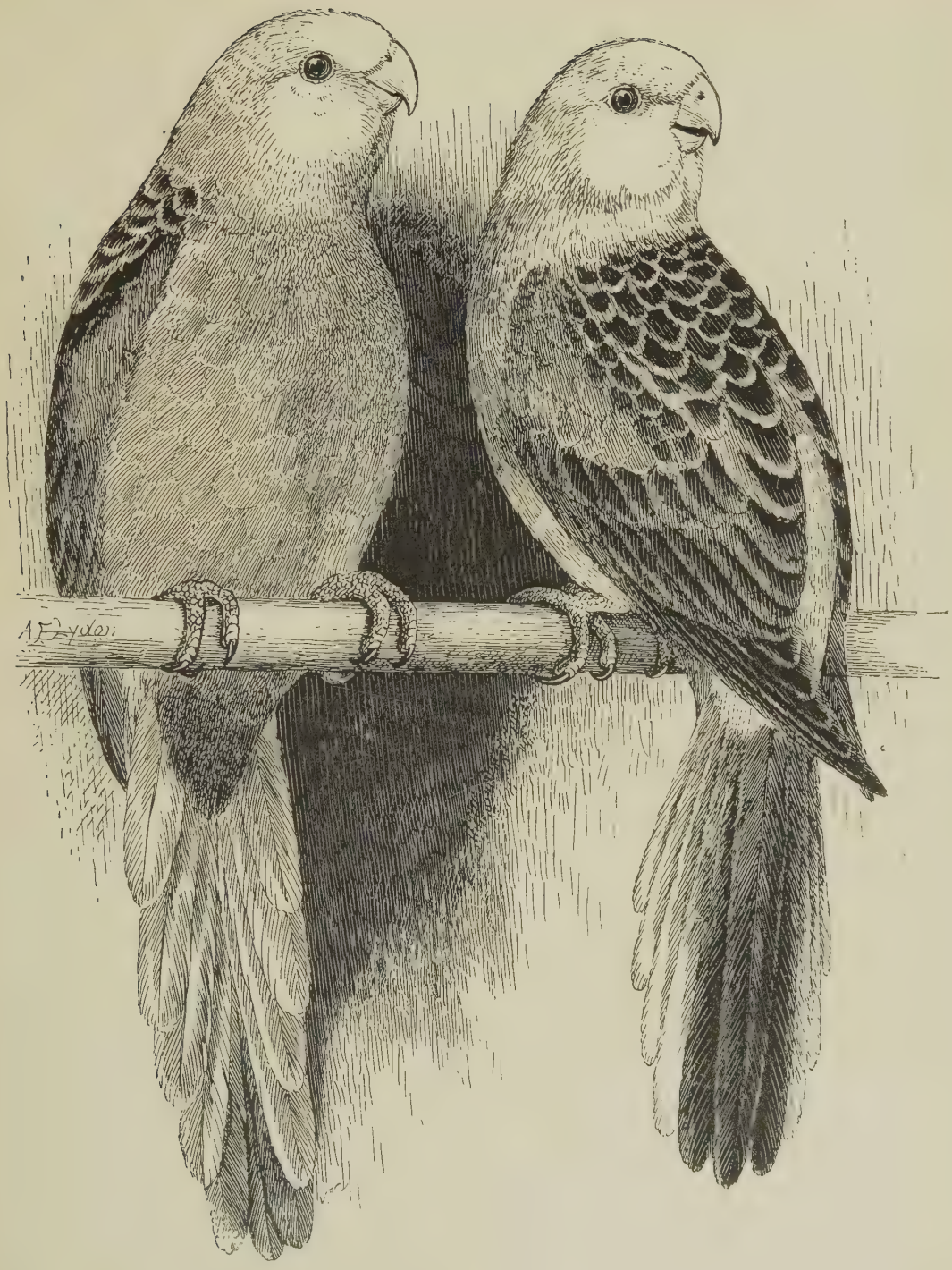
Mr. Seth-Smith had a pair which showed the greatest antipathy to a pair of Blue-bonnet Parrakeets in the adjoining aviary, and made themselves so objectionable to the latter by biting their toes severely through the wire that he had to get rid of them.

A very nice specimen of this bird was exhibited by Mr. Dewar at the Crystal Palace Show in 1892, and other specimens have appeared on the bench since then.

The first two specimens to reach our Zoological Gardens were presented in 1863; altogether, at least a dozen examples have been exhibited there at various times.

Blue-cheeked Parrakeet (*Platycercus amathusia*).

Differs from the preceding species in the paler yellowish edges to the feathers of the back, in the yellower tinge of the feathers of the rump and upper tail-



Mealy Rosellas.

coverts, the almost entirely blue cheeks, the yellow tinge of the upper breast, the greener tinge of the lower breast and abdomen and of the base of the two central tail-feathers. Female apparently differing in its less swollen upper mandible. Hab., North Australia, from Port Darwin to Rockingham Bay.

Nothing seems to be known respecting the life-history of this bird; an example was received in exchange at the London Zoological Gardens in 1887, and in the following year no less than ten examples were deposited there.

The Red-mantled Parrakeet (*Platycercus erythropeplus*) is now known to be merely a hybrid between Pennant's Parrakeet and the common Rosella. It first reached the London Zoological Gardens in 1890.

Brown's Parrakeet (*Platycercus browni*).

Feathers of back and scapulars black bordered with pale yellow; those of the rump and upper tail-coverts pale yellow, with the concealed bases and fringes black; a black patch on the wing-coverts; anterior coverts from bend of wing downwards, base of primaries, and outer webs of secondaries, blue; the last inner secondaries edged with pale yellow; inner webs of flights black; central tail-feathers blue, tinged with green at base, the others with the base of inner webs brown, of outer webs deep blue, beyond which they are pale blue with black shafts and white tips; crown, lores, and ear-coverts black; cheeks white, bounded by blue below; feathers of breast and abdomen pale yellow, with black concealed bases and fringes; under tail-coverts scarlet; under wing-coverts blue; beak pale horn-colour, becoming blue at base; feet blackish-brown; irides blackish-brown. Female probably differing as in the other species. Hab., North Australia, from Port Darwin to Port Essington.

Gould observes ("Handbook to the Birds of Australia," Vol. II., p. 53): "This is a very abundant species on the northern and north-western coast of Australia, where it inhabits grassy, meadow-like land and the edges of swamps, and mostly feeds upon the seeds of grasses and other plants; sometimes it is seen in pairs, but more frequently in families of from ten to twenty in number. It frequently utters a rapid succession of double notes resembling '*trin-se trin-se.*' Its flight is low, somewhat rapid and zigzag, seldom further prolonged than from tree to tree."

The nidification of the species appears to be still undescribed. Brown's Parrakeet, known in Australia as the Smutty Parrakeet, appears to have been first exhibited by Mr. Fulljames in 1899; in 1900 four examples were deposited at the London Zoological Gardens; in 1901 a few were imported, and Mr. Seth-Smith secured a pair, which I had the pleasure of seeing in his aviaries. The cock bird eventually fell out with his wife, and would have murdered her if they had not been separated. In 1902 the Hon. Walter Rothschild had a pair; the hen laid eggs. In 1903 an example was exhibited at the Crystal Palace.

Rosella Parrakeet (*Platycercus eximius*).

Crown of the head, back of neck, chest, and under tail-coverts crimson; cheeks white; the feathers of the back black, bordered with rich yellow; the rump, upper tail-coverts, and lower belly pale green; the centre of belly yellow; the shoulders and middle of wing blue, as also the edges of the primaries, which are otherwise dark brown; the two central tail-feathers green with bluish tips; the remaining tail-feathers dark blue at base, shading into light blue beyond and tipped with white; the beak horn-colour; legs and iris of eye brown. Female smaller, slightly duller in colouring, often, if not invariably, with a small round green spot on the crimson of the nape, not an irregular patch (as sometimes occurs in male birds); the beak shorter and rather narrower at the base. Hab., S.E. Australia, from Wide Bay district to Victoria, and Tasmania.

The natural resorts of this bird, according to Gould, are "open parts of the country, undulating grassy hills and plains bordered and studded here and there with large trees or belts of low acacias or banksias, among the branches of which, particularly those of the acacias, it may be seen in companies. In a word, districts of a sandy nature, small plains, open spots among the hills, and thinly-timbered country where grass abounds, constitute its natural habitat. It is constantly to be seen on the public roads, and, upon being disturbed, will merely fly to the nearest tree or the rails of wayside fences. Its natural food consists of seeds of various kinds, especially grasses, and occasionally insects and caterpillars. Its flight is short and undulating, rarely extending more than a quarter of a mile, the bird frequently alighting on a leafless branch, always flying a little below it and rising again just before settling." The Rosella breeds in holes in the branches of trees, its breeding season being from October to January; it lays from five to nine eggs.

The Rose Hill Parrakeet, popularly called the "Rosella," is the best-known species of the genus *Platycercus*. It is a common bird in Australia, and is largely imported into this country, where, on account of its gorgeous colouring and cheapness, there is a large demand for it, both as a cage and aviary bird. In Europe it has frequently been bred in aviaries. Anyone wishing to breed it should provide a commodious log nest, and, after the young are hatched, bread soaked in cold water and pressed nearly dry should be supplied to the parents. From what I have seen of this species, I should expect to have no difficulty in persuading it to pair either with a hen of its own species or any other of the same genus.

I had a male of this species given to me about 1889 or 1890. I found it noisy, but not unpleasantly so; only a slightly irritating sound, a sort of incessant *arra-charra-chakarra*, or something to that effect, and if I whistled to him he always accompanied me with that sound; when, however, he heard my Persian Bulbul singing he used to stand up, stretch his neck, spread his tail, and utter a long whistle. He made assiduous love to a Red-crested Cardinal in the aviary with him, and seemed puzzled that she seemed unwilling to accept his attentions.

Being perfectly hardy, and indifferent to cold, this bird may be kept either in or out of doors.

The first example recorded as having been exhibited at Regent's Park was presented to the London Zoological Society in 1861; after that no more were received until 1866, when half-a-dozen were deposited; in 1868 two were presented, and after that one or more examples came to hand almost annually, the last recorded in the ninth edition of the list being presented in 1895.

Yellow-mantled Parrakeet (*Platycercus splendidus*).

Differs from the preceding species in having no yellow on the nape, the borders of the feathers on the back gamboge-yellow instead of greenish-yellow; the rump, upper tail-coverts, and lower abdomen pale verdigris-green instead of yellowish-green; beak horn-colour; feet mealy-brown; irides dark brown. Female probably differs in the less swollen character of the upper mandible. Hab.,

Stanley Parrakeets.

Eastern Australia from Wide Bay district to New South Wales and the interior.

The wild life of this species appears to be unknown, though it would doubtless correspond closely with that of the Rosella Parrakeet. It is a very rarely imported bird, and is not recorded in the ninth edition of the London Zoological Society's list; nor does Russ mention it in his "Handbook." I include it on the authority of the author of "Parrakeets."

STANLEY PARRAKEET (*Platycercus icterotis*).

Crown of the head, back of neck, chest, and under-surface crimson; cheeks and thighs yellow; back black, each feather bordered with green, yellow, and sometimes crimson; rump and upper tail-coverts golden-green; shoulders and outer edges of the primaries blue, the tips and inner webs blackish-brown; the two central tail-feathers green, the remainder light blue, tipped with white, their basal portion being darker and with a greenish shade; beak light horn-colour, legs dull ashy-brown; iris of eye blackish-brown. Female apparently greener than the male, and with a less swollen beak; it is said to have very little red in its plumage. Hab., South-Western Australia.

Mr. Gould tells us "it is one of the most common birds in the country, and, except in the breeding season, may always be seen in large flocks, which approach so near the houses of the settlers as frequently to visit their gardens. The flight of this Parrakeet is of short duration, and consists of a series of rather rapid undulating sweeps; it usually feeds on the ground, eating seeds of various grasses, but not infrequently it also attacks unprotected ripe fruit in gardens; its note is a feeble, piping kind of whistle, which is occasionally so much varied and lengthened as almost to assume the character of a song." Its six or seven white eggs are deposited in holes in large trees, without any form of nest.

Some of our readers may remember Mrs. Pretyman's beautiful example, and the illustration of it which appeared in *The Feathered World*. I don't think I have ever seen a second specimen. Why are these common Parrakeets so seldom brought home? Do they die on the journey from Australia, or does it pay better only to import a few and get higher prices for them? Even in Germany the price of the Stanley Parrakeet, according to Russ, is "very high on account of its rarity," and yet it is quite common.

The London Zoological Society received its first example of the "Stanley Broadtail" in exchange in 1864, and, from first to last, something like a dozen specimens must have been exhibited at the Gardens, the last recorded in the ninth edition of the "List of Animals" being deposited in 1893.

PILEATED PARRAKEET (*Porphyrocephalus* spurius*).

Back, scapulars and upper wing-coverts green; rump and upper tail-coverts greenish-yellow, the longest of the latter green; front edge of wing, primary-coverts and primaries at base of outer webs dark blue; central tail-feathers green, changing to deep blue towards the tips; lateral feathers green at base, crossed by a black band, then changing to blue, which becomes paler towards the tips, the third and fourth pairs with white tips; crown deep maroon-red; lores dusky-red; cheeks yellowish-green; sides of neck yellower; breast and abdomen violaceous blue; vent greenish-yellow, with broad red tips to the feathers; thighs red, whitish at base of feathers; under wing-coverts deep blue; under tail-coverts red; beak horn-colour; feet dull brown; irides dark brown. Female smaller, duller, and with a lighter beak. Hab., Western Australia, from King George's Sound to Port Essington.

Gould says of this species ("Handbook," Vol. II., pp. 60, 61): "It is usually seen in small families feeding on the ground, but upon what kind of food it subsists has not been ascertained. The breeding season extends over the months of October, November, and December. The hollow dead branch of a gum or mahogany tree is the place usually chosen by the female for the reception of the eggs, which are milk-white, and from seven to nine in number, about an inch and an eighth long by seven-eighths of an inch broad.

"The flight of this species, although swift, is not of long duration, nor is it characterised by those undulating sweeps common to the members of the genus *Platycercus*. Its voice is a sharp clucking note, several times repeated, in which respect it also offers a marked difference from those birds."

According to Mr. A. J. Campbell, this Parrakeet, loves "to feed upon the kernel of the native pear (*Xylomelum*) when the fruit opens under the summer sun."

This is a rarely imported species, of which an example was exhibited for several years at the Crystal Palace. The late Dr. Greene also had a specimen, which he describes in his "Parrots in Captivity," Vol. III., p. 8. According to Russ, Mr. Abrahams imported it on several occasions. It first came into the possession of the London Zoological Society in 1854, and others were purchased subsequently.

The genus *Barnardius* chiefly differs structurally from *Platycercus* in the want of the notch in the upper mandible; the character of its colouring also differs. It requires the same treatment in captivity, and altogether seems much more closely related to the true Broadtails than *Porphyrocephalus*.

BARNARD'S PARRAKEET (*Barnardius barnardi*).

Various shades of green represent the chief colouring of this Parrakeet; but the forehead is crimson; the lower part of the cheeks bluish; a broad olive brown band crossing the crown to the eyes, and behind this a yellow crescent across the nape; back bluish-grey; primaries and bastard wing black edged with blue externally, but the apical half of the outer webs of the primaries grey; lesser wing-coverts deep blue; central tail feathers deep blue at the tips; other feathers deep blue, becoming bluish-white at the tips; centre of abdomen crossed by a broad orange crescent; beak horn-colour; feet brown; iris dark brown. Female smaller, duller, the back greener, the beak shorter and less powerful. Hab., South Australia, New South Wales, and the Interior.

Gould says that: "To see Barnard's Parrakeet in perfection, and to observe its rich plumage in all its glory, the native country of the bird must be visited, its brooks and streamlets traced; for it is principally on the banks of the latter, either among the 'high-flooded gums' or the large shrub-like trees along the edges of the water, that this beautiful species is seen, and where the brilliant hues of its expanded wings and tail show very conspicuously as it passes from tree to tree amidst the dark masses of foliage.

"It is generally met with in small companies of

* Characterised by its long, slender upper mandible, which is notched and terminates in a long hook. According to Mr. Seth-Smith it should be treated in captivity like the King Parrakeet (*Aprosmictus*).

from five to ten in number, sometimes on the ground among the tall grasses, at others among the high trees, particularly the *Eucalypti*."

Mr. North says : "In the cultivated portions of the country the birds assemble together in small flocks, and commit great depredations on the crops, consequently a merciless warfare is waged against them by the farmers. For a set of the eggs of this species I am indebted to Mr. Joseph A. Hill, of Pine Rise, Kewell, Victoria, who obtained them after carefully watching a pair of birds for some time in the vicinity, on Sept. 15, 1887. They were deposited on the decaying wood, about 2 ft. down the hollow limb of a *Eucalyptus*, at a height of 30 ft. from the ground. The eggs are five in number for a sitting, pure white, oval in form, nearly equal in size at both ends."

"The species breeds during September and the three following months."

In 1902 Mrs. Johnstone, of Bury St. Edmunds, succeeded in breeding this handsome species in her aviaries. She published an interesting account of her experience in *The Avicultural Magazine*, First Series, Vol. III., pp. 249-251. According to Miss Alderson, it is a perfectly hardy bird, preferring even during a bitter winter to spend the night in an outdoor flight to remaining under cover. The species is one well known to aviculturists, but by no means so freely imported as to have become cheap. On the Continent it was bred by Baron von Cornely. It was first purchased by the London Zoological Society in 1853, and others have been received subsequently.

In Australia this is called the "Bulla-Bulla Parrakeet."

Yellow-naped Parrakeet (*Barnardius semitorquatus*).

Green; a broad yellow collar at the back of the nape; outer wing-coverts yellowish-green; lesser coverts tinged with verdigris; primary-coverts and base of outer webs of primaries deep blue; two central tail-feathers dark green, the next pair shading into blue and becoming bluish-white at tips; lateral feathers similar, but only green at base; head brownish-black, with a red frontal band; cheek-feathers and ear-coverts tipped with dark blue; upper breast dark green, slightly bluish; lower breast, sides, and under tail-coverts yellowish-green; under wing-coverts blue mixed with green; flights below black; beak pale horn-colour, changing to leaden at front of upper mandible; feet dark brown; irides dark brown. Female smaller, with the head browner and the green colouring darker, the beak much shorter and rather broader at base. Hab., Western and South-western Australia.

According to Gould ("Handbook," Vol. II., p. 42), this Parrakeet "inhabits almost every variety of situation, sometimes searching for food upon the ground, and at others on the trees, its chief food being either grass-seeds or the hard-stoned fruits and seeds peculiar to the country in which it lives."

"While on the wing its motions are rapid, and it often utters a note, which, from its resemblance to those words, has procured for it the appellation of 'Twenty-eight' Parrakeet from the colonists, the last word or note being sometimes repeated five or six time in succession.

"The *Platycercus semitorquatus* begins breeding in the latter part of September or beginning of October, and deposits its eggs in a hole in either a gum or mahogany tree, on the soft black dust collected at the bottom; they are from seven to nine in number, and of a pure white. In most instances these eggs have a pinky blush before being blown."

A well-known but not very frequently imported species; it is sometimes confounded with the next species, and Mr. Pays Mellier, of Champigny, in 1882, bred hybrids between the two species. It was first presented to the London Zoological Society in 1862, and one or two other specimens have been acquired since that date.

Bauer's Parrakeet (*Barnardius zonarius*).

Differs from the preceding species in its inferior size, the want of the red frontal band, and its yellow lower breast and abdomen. The female is duller in colouring, has a browner head, the beak wider in the middle, less regularly triangular, and narrower towards tip. Hab., Victoria, South, West and North-west Australia, and the Interior.

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," p. 642) thus describes the nidification :—"*Nest.*—Within a hole or hollow branch of a tree, the eggs, as in the case of the majority of the tribe, being deposited on the dry decayed dust at the bottom. *Eggs.*—Clutch, five or more; roundish in shape; texture of shell fine; surface glossy, with occasionally tiny limy nodules; colour pure white. Dimensions in inches of a proper clutch from Western Australia : (1) $1.27 \times .96$, (2) $1.2 \times .94$, (3) $1.2 \times .93$, (4) $1.19 \times .9$, (5) $1.18 \times .95$; of odd examples from Central Australia : (1) $1.15 \times .96$, (2) $1.1 \times .91$."

According to Mr. Keartland, "Although generally in pairs, flocks of six or seven are not uncommon, probably being the parent birds and young brood. Their chief food is grass-seed, but they also display great activity in climbing amongst the foliage in search of blossom."

In Australia this is known as the "Yellow-banded" or "Port Lincoln" Parrakeet; it is not rarely imported into this country, but it is doubtful whether it has been bred here, though Mr. Kohler, of Weissenfels, had a pair which went to nest and reared four young. It seems likely enough that Dr. Greene's observation respecting the ease with which the Yellow-naped Parrakeet goes to nest and brings up its young may in reality apply to the present species, since neither does Mr. Seth-Smith know of an instance of the breeding of *B. semitorquatus* in this country, nor does Dr. Russ, in his "Handbook" (whatever he may have done elsewhere), record any instance of the pure species being bred on the Continent, but only the rearing of hybrids.

This Parrakeet first reached the Regent's Park Gardens in 1863; others have since been added to the collection there.

The genus *Psephotus* has the two central tail-feathers longer than the pair next to them; it contains what Mr. Seth-Smith regards as perhaps the most beautiful, delightful, and desirable of the imported *Parrakeets*. I have no doubt they are excellent subjects for aviculture, but the colouring of some of them does not appeal to me personally. The species of *Barnardius* strike me as infinitely more beautiful, but each one to his taste.

In captivity Mr. Seth-Smith recommends canary-seed as the staple food for these birds, to which should be added millet, a little hemp and oats, and plenty of green food during the summer months; but on no account soft food unless they are breeding, and then only bread soaked in cold water and squeezed nearly dry.

Red-vented Blue-bonnet Parrakeet (*Psephotus hæmatorrhous*).

"The male has the forehead and face ultramarine blue; crown of the head, upper surface, sides of the neck, and the chest greyish olive-brown, washed with

yellow on the rump and upper tail-coverts; lesser wing-coverts mingled verditer green and blue; greater coverts rich reddish chestnut; basal half of the external webs of the primaries and secondaries and edge of the wing rich indigo blue; under surface of the shoulder light indigo blue; inner webs and tips of the primaries dark brown; apical half of the external web of the primaries fringed with grey; two centre tail feathers light olive-green, passing into deep blue at the tip, the remainder deep blue at the base, largely tipped with white, the blue gradually blending with the white on the external web; upper part of the abdomen and flanks primrose yellow; centre of the abdomen and under tail-coverts crimson-red; irides dark brown; feet mealy brown; bill horn-colour. The female differs in being smaller and less brilliant in all her markings." (Gould.) The beak of the female also appears to be smaller and shorter than in the male. Hab., Interior of New South Wales.

As regards its habits, Gould says: "I met with it in tolerable abundance in the neighbourhood of the Lower Namoi, where it appeared to give a decided preference to those parts of the plains which were of a loose mouldy character, and with which the colour of its back so closely assimilates as to be scarcely distinguished from it. Like the other members of the family, it is mostly observed in small flocks, feeding upon the seeds of the various grasses abounding on the plains."

As might be expected from this account, canary, millet, and a few oats should form the staple seeds in captivity, but a little hemp may be added with advantage. It is fond of gnawing green branches of poplar or other wholesome trees; plum or apple would probably please it well.

The eggs of this bird number about seven, are pure white without gloss; they are deposited in hollow branches of *Eucalyptus*.

The greatest caution must be exercised in associating this Parrakeet with others, as it is very liable to run amuck amongst smaller and weaker associates, which it murders most ruthlessly. On the other hand, it is hardy, amusing, intelligent, and graceful, though I cannot admire its patchy and inharmonious colouring.

According to Russ, a female of this Red-vented species in the possession of the late Joseph Abrahams laid eggs, by which means he was able to decide its sex. He tells us also that in 1882 Mr. Jamrach had a snow-white Blood-vented Parrakeet, only with a blue cap and red breast patch. According to the late Mr. Wiener it is a pleasing, playful and most intelligent bird. It would seem, however, from what Mr. Seth-Smith tells us, that Mr. Wiener's example was intermediate between this and the next species.

The Zoological Society of London first purchased the species in 1862, and subsequently they added others to their collection; now it seems not to come to hand.

Yellow-vented Blue-bonnet Parrakeet (*Psephotus xanthorrhous*).

Differs from the preceding species in the olive-yellow (instead of reddish chestnut) patch on the wing-coverts, the deep blue lesser coverts, the better defined yellowish crescent on the front of the ear-coverts, the more distinctly mottled breast, and the yellow (instead of red) under tail-coverts; beak pale horn-colour; feet mealy brown. Female probably with a smaller beak than the male. Hab., "South Australia." (Salvadori.)

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," p. 644) says: "The Yellow-vented Parrakeet, or the 'Blue Bonnet' of the bird-catchers, is chiefly found in the interior portions of New South Wales and Victoria, notably on the plains of the Murray and Riverina, where it retires to the belts of timber to breed. It is also found in South and Western Australia." When flying through the belts of timber in pairs or small flocks, their voices are harsh and grate upon one's ears.

"I first received eggs from Mr. G. H. Morton, Benjeroop, 1883, and the following season I myself found the species nesting in the belts of timber near Pyramid Hill, where, on the 8th October, seven young ones, about three or four weeks old, were taken from a nest.

"Apparently these Parrakeets are not always easily flushed from their nests. Mr. Morton tells me he has taken eggs from under the sitting birds."

On p. 643 Mr. Campbell thus describes the nidification: "*Nest.*—Within a hole or hollow, usually in a box-tree (*Eucalyptus*), growing in belts of timber on the plains; also reported to breed in the cliffs of the Lower Murray River. *Eggs.*—Clutch, five to seven usually, ten maximum; round in shape, texture of shell fine, surface glossy, colour pure white. Dimensions in inches of a clutch: (1) 1.0 × .84, (2) .94 × .84, (3) .94 × .8, (4) .92 × .84, (5) .92 × .82."

This is one of the most dangerous Parrakeets to associate with other birds in an aviary, as everyone who has kept it testifies. It appears to have been bred many years ago by Mr. A. Johnson, of St. Olave's Grammar School, and Russ mentions that a *female* in the possession of Messrs. Seitter, of Ludwigsburg, laid eggs. The species is not mentioned in the London Zoological Society's List, but possibly it may have been wrongly identified as "*P. hæmatogaster*" (*hæmatorrhous*). It is well known as an imported species under the name of "Blue-bonnet."

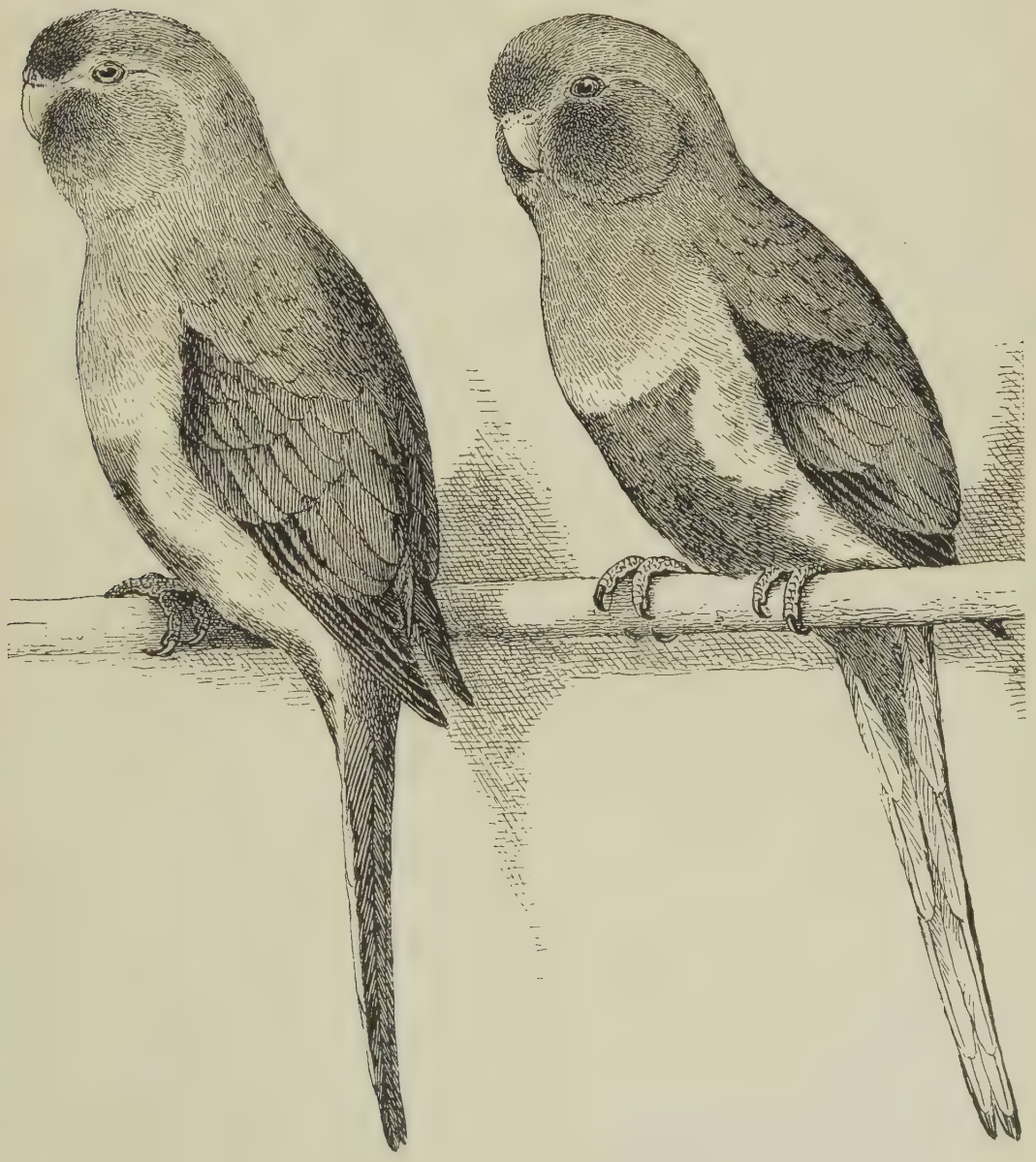
Beautiful Parrakeet (*Psephotus pulcherrimus*).

The male has a frontal band of scarlet, which fades into pale yellow round the eyes, lores, and cheeks, the latter gradually shading into the green of the under-parts; the crown and nape are blackish-brown, fading into greyish-brown on the back; the sides of the neck and shoulders bluish-green with yellowish reflections; the rump and upper tail-coverts greenish-blue, the longer coverts with black terminal bands; a spot of vermilion on shoulder of wing; the primaries and secondaries black, edged with green above and blue below; two middle tail-feathers olive-brown, bluer towards the tips; the three outer lateral feathers with a zigzag black band, beyond which they are greenish-blue to the tips, the inner webs almost white at the tips; throat and chest emerald-green, each feather with a bluish tip; middle of breast and flanks greenish-blue; abdomen and under tail-coverts scarlet; beak horn-colour, blackish towards the base; feet yellowish-brown; iris dark brown.

The female is smaller and duller than the male, with little or no red on the forehead, less on the wing-coverts, abdomen, and vent; all the bright golden-green in the plumage is replaced by pale brassy-yellowish, flecked or barred with golden ochre or red. Hab., Eastern Australia, from Port Denison to New South Wales.

This species frequents upland grassy plains, where it is observed in small flocks feeding upon the seeds of grasses and other weeds. It nests in the hollow branches of trees or the deserted burrow of Leech's Kingfisher; sometimes in that of Macleay's Kingfisher, tunnelled into the nest of the white ant. The eggs are white and three to four in number.

Mr. Wiener evidently regards this bird as very delicate, but Mr. Seth-Smith is of opinion that its supposed



Red-vented Blue-bonnet Parrakeets.

delicacy was due to its being wrongly fed in captivity, and he says: "Given plain food, such as the best canaryseed, millet, a little hemp, and perhaps a few oats, and a regular supply, especially in the spring and summer, of chickweed or grass in flower, there is little doubt that the Paradise Parrakeet would prove to be no more difficult to keep in health than the Many-coloured or the rare Golden-shouldered Parrakeets, which have both been proved to be, when once acclimatised, long livers in captivity." ("Parrakeets," p. 200.)

Formerly tolerably freely imported, this species seems now never to be sent home; it is generally regarded by aviculturists as the most beautiful of Parrakeets, but the colouring consists mainly of violent contrasts; it is showy and brilliant unquestionably, but hardly artistic, though certainly far ahead of the Blue-bonnet Parrakeets. I consider the "Many-coloured" a far more beautiful bird. The London Zoological Society acquired a pair of this species in 1866, and for some years afterwards added specimens to the collection at Regent's Park. Prince Ferdinand of Saxe-Coburg-Gotha bred one young one in his bird-room at Vienna in 1880, and Princess von Croy bred four in 1882 at her castle in Belgium. Previously the latter lady had bred hybrids between a male Beautiful Parrakeet and a female Red-rumped Parrakeet; the mules chiefly differed from their father in the blue-green instead of blue colouring on the breast and lower back; they sang like the Red-rump. (Cf. Russ, "Handbuch," p. 177.)

Golden-shouldered Parrakeet (*Psephotus chrysopterygius*).

Back of neck, back, scapulars, inner upper wing-coverts, and inner secondaries pale greyish-brown; a large yellow patch on the anterior lesser and median wing-coverts; greater coverts and flights black edged with blue; rump and upper tail-coverts turquoise-blue; two central tail-feathers olive-green at base, changing to deep blue towards the tips, which are black; the other feathers pale bluish-green crossed by an irregular black band, stained with bluish-green on outer webs towards the tips, which are white; forehead pale yellow; centre of crown black; sides of head, neck, throat, breast, and front of abdomen turquoise-blue; a wash of yellow on orbital region; under wing-coverts deep blue; middle of abdomen and under tail-coverts red barred with white; beak and nostrils bluish horn-colour; feet mealy-grey; irides brown. Female (according to Seth-Smith) with "the frontal band yellowish-white; crown brownish; sides of head nearly white, washed with blue; under parts greenish washed with blue down to the lower abdomen and under tail-coverts, which are marked with red and white, as in the male, but much fainter; back, scapulars, and upper wing-coverts yellowish-green, the yellow becoming brighter on the wing-patch; rump and upper tail-coverts bright blue; primaries blackish, edged with blue on the outer web; tail as in the male." Hab., North Australia, from Port Darwin to the Gulf of Carpentaria.

Nothing seems to have been published respecting the wild life of this rare Parrakeet, but in 1897 eight immature birds appeared in the London bird market; the only male and a female were purchased by the Zoological Society, but no attempt was made to breed from them. Mr. Reginald Phillipps acquired two females (see *The Avicultural Magazine*, First Series, Vol. IV., p. 152), one of which paired with a male Red-rumped Parrakeet and laid four eggs, which, unfortunately, proved to be clear; they are described as small, of a stout oval in shape, of precisely the same length as those of the Peach-faced Love-bird, but thicker." (*The Avicultural Magazine*, Vol. V., p. 158.)

Mrs. Johnstone obtained a pair in 1902; both she and Mr. Phillipps describe them as sensitive to cold.

Many-coloured Parrakeet (*Psephotus multicolor*).

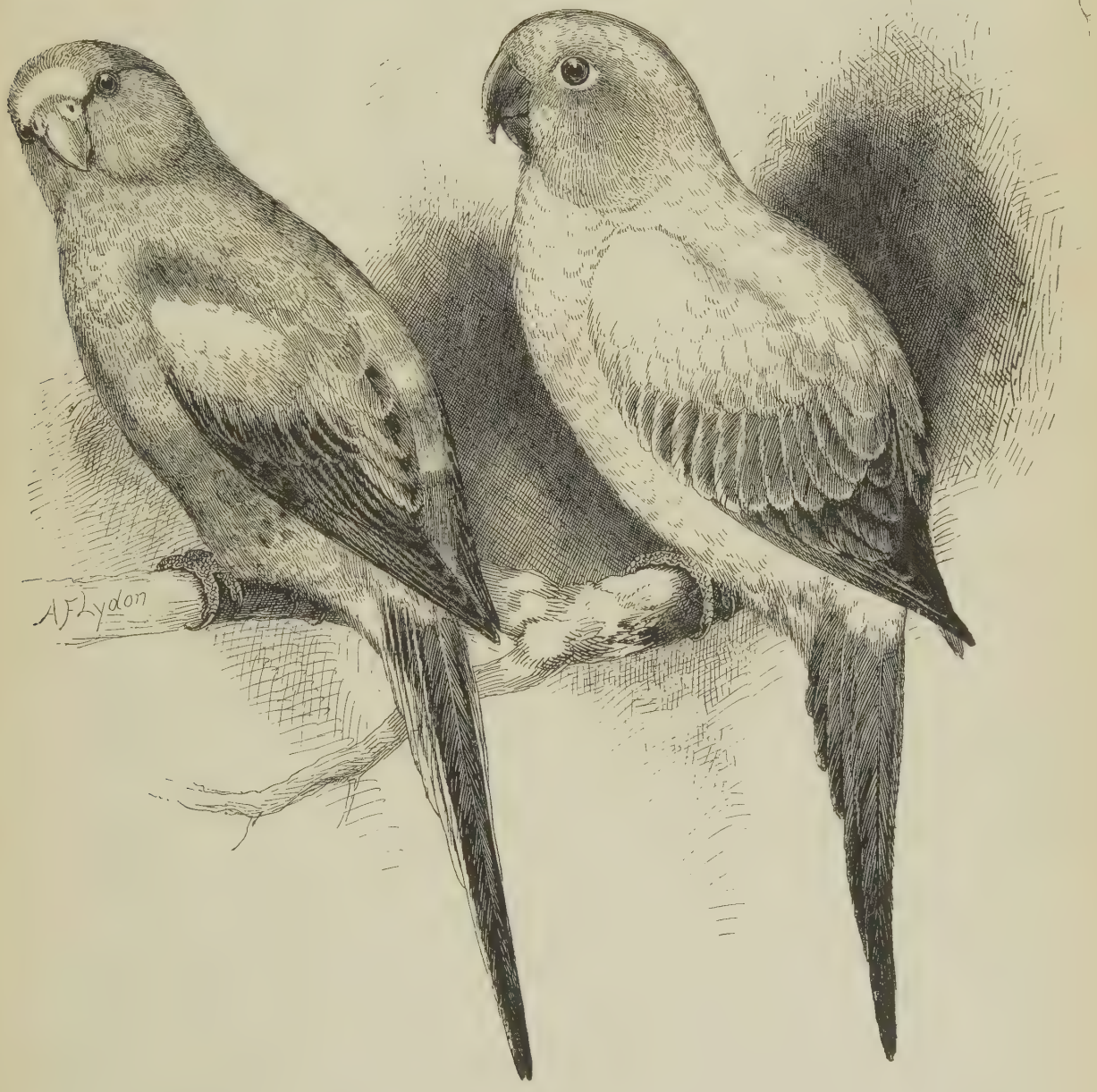
The upper surface of the cock bird is principally emerald-green; the forehead, a band on the shoulder, the sides, and vent yellow; the back of the crown, rump, abdomen, and thighs crimson; the throat and breast yellowish-green; the primaries deep blue, with a greenish tinge; the tail-feathers greenish-blue; the two central feathers and bases of the remainder very dark, banded with black towards the base, the outer ones pale blue at the tips; beak horn-brown; legs wood-brown. Female smaller, with a much shorter beak; altogether duller in colouring; the frontal blue band paler as well as the blue on the shoulder of the wing and the yellow on the under tail-coverts. Mr. Seth-Smith also tells us that the upper parts are "mostly brownish-grey with an olive-green tinge, the *patch on the wing-coverts red;* frontal band reddish in some individuals, yellowish in others; some specimens have a faint patch of reddish on the occiput, which is absent in others; lower breast, abdomen, and under tail-coverts yellowish-green with a bluish tinge; a faint indication of red on some of the feathers of the abdomen." Hab., Interior and South of Australia.

Mr. A. J. Campbell tells us that this species is found in the open forest country of the interior portions of Southern Australia; in Central Australia it is found near all water-holes; eggs in his collection were obtained from a nest in a hollow mallee limb. He thus describes the nidification: "*Nest.*—Within a hole or hollow trunk of a tree. *Eggs.*—Clutch, four to six; round in form; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches: (1) .9 × .76, (2) .9 × .72, (3) .89 × .76, (4) .88 × .75, (5) .86 × .76, (6) .86 × .75." ("Nests and Eggs," p. 647.)

Formerly this species was supposed to be extremely delicate, but Mr. Seth-Smith, who has kept and bred this really beautiful bird in his aviaries (where I had the pleasure of seeing them), assures us that, although when first imported they need care, no sooner are they established than they become almost as hardy as the Red-rumped Parrakeet; they should, however, receive a little warmth in the winter. Mr. A. Savage, of Rouen, the Rev. C. D. Farrar, Mr. W. Fasey, and, I think, Mrs. Johnstone have also bred the species in their aviaries; so that, though expensive, this is a most desirable bird for the aviculturist. The first pair to reach the Gardens at Regent's Park was purchased in 1862, and others have been added to the collection from time to time since that date.

Red-rumped Parrakeet (*Psephotus hæmatonotus*).

The crown of the head, back of the neck, cheeks and breast are emerald-green, paler on the forehead and cheeks; the back brownish-green; the rump crimson; the apex and under-surface of the shoulder, bastard-wing, and outer edge of the basal half of primaries bright ultramarine blue, the blue of the shoulder shading into sulphur-yellow and forming a conspicuous spot of this colour in the centre of this part of the wing; the greater and lesser wing-coverts and the secondaries bluish-green; the upper tail-coverts and two central tail-feathers green, passing into blue towards the tips, which are blackish-brown; the remainder green at the base, shading into greyish-white on the inner webs and tips; centre of the abdomen yellow:



MANY-COLOURED PARRAKEET.

SUN PARRAKEET OR YELLOW CONURE.

thighs dull bluish-green; under tail-coverts greyish-white; beak horn colour; legs brown; iris of eye pale brown. Female with the middle of the abdomen pale yellow; " vent and under tail-coverts white; wing-coverts greyish-green, tinged with blue; primary-coverts and outer web of primaries dull blue." (Seth-Smith); the beak is smaller and shorter than in the male. Hab., South-Eastern and Southern Australia.

Mr. Gould says that the Red-rump is found in the interior of South-East Australia, being abundant over the Liverpool plains and all open country northward as far as explored; also over similar tracts in Victoria and South Australia; it is seldom seen on the plains round Adelaide; it is more often seen on the ground than in trees, and evidently prefers open grassy valleys and naked crowns of hills to a wide and almost boundless plain. During winter it congregates in flocks of from twenty to a hundred individuals, which trip nimbly over the ground in search of grass and other seeds; frequently hundreds may be seen sitting in lines along the whole length of a naked eucalyptus branch. The Red-rump has a pleasing whistle, which almost approaches a true song; its five to six white eggs are deposited in spouts and hollows of gum trees.

Mr. A. Savage, who gives an interesting account of the rearing of this species in the fifth volume of *The Avicultural Magazine* (pp. 28-31), mentions only seed and chickweed as having been given to them, but a little bread soaked in cold water, and then pressed nearly dry, greatly assists all these Parrakeets in feeding their young. The Red-rump is easily bred, and Mr. Savage reared numbers in a large cage in his garden at Rouen; it has also been bred in this country and in Germany, two, or even three, broods being reared in a season. It is an easily tamed species, but must be kept in an aviary or bird-room by itself, as it is extremely malicious towards smaller and weaker birds. When breeding, Dr. Russ recommends that these birds should be fed upon " egg-bread, ants' eggs, softened rice, fruit, mealworms, green food, and mawseed," but I consider most of these items as not only unnecessary for a bird of this kind, but positively injurious.

The first pair of this Parrakeet to reach the Gardens at Regent's Park was purchased in 1861, and others have since been added; it is a very well-known species amongst bird-lovers.

The genus *Neophema* (Grass-Parrakeets) is characterised by the four central tail-feathers being of equal length. In their wild state they feed chiefly upon seeds of various grasses, and in captivity canary, millet, and green food are most suitable for them. They are graceful birds, the sexes of which are much alike in colouring.

Bourke's Grass-Parrakeet (*Neophema bourkei*).

Above rufescent brown; anterior upper wing-coverts and outer webs of flights violaceous blue; outer upper tail-coverts pale blue; other coverts with pale edges; three outer tail-feathers white, excepting at the base, which is brown on the inner, and blue on the outer, web; six middle feathers with the outer webs tinged with blue, otherwise brown like the rest of the upper surface; forehead and an eyebrow stripe of pale blue; a few feathers on the former, a stripe below the latter, and a patch below the eyes, and on front of cheeks whitish; cheeks otherwise rosy, each feather with a brown edge; feathers of breast brown edged with rose; abdomen bright rose-pink; flanks and under tail-coverts pale blue; beak dark horn colour; feet brown; irides brown. Female rather smaller, with a much shorter beak, the terminal hook of which is thicker; she is also duller and paler, with no blue frontal band. Hab., " Interior of New South Wales, and of South Australia." (Salvadori.)

Mr. A. J. Campbell says of this bird (" Nests and Eggs," p. 649): " Of birds kept in captivity it has been ascertained that the male bird assists in the task of incubation, and in all probability this rule applies to the other members of this beautiful genus.

" With the original description of an egg, furnished in the ' Catalogue ' of the Australian Museum, it is stated that the late Mr. K. H. Bennett took a set of these rare Parrakeets' eggs on August 20th, 1884, in the interior of New South Wales.

" Breeding season includes August and probably the three or four following months."

He thus describes the nidification: " *Nest.*—Within a hole or hollow in a tree. *Eggs.*—Clutch, four, in some instances probably five; inclined to oval in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches about .9 × .7."

When Mr. Seth-Smith wrote his " Parrakeets " this species was, and had been for about twenty years, practically unknown in the bird market, though previous to that date a few pairs were imported. He describes a pair in the possession of Mr. Groom, of Kentish Town, which went to nest; incubation lasting about seventeen days; the hen died about the time when the young hatched, and apparently none were reared. In Germany Dr. Russ appears to have been the first to breed it in his bird-room, and afterwards various others were successful. " Mr. Kessels, of Uccle, owned a pair for nine years, which, in the first summer, bred six young and then every year several others. In 1877 from February 17th to September 7th nineteen young from five broods. Clutch three to seven, usually five eggs; duration of incubation twenty-two days; nestling down pure white; young plumage similar to that of the adult female, but duller in all its colours, and the young male, though it has a blue frontal band, has it weak and narrow." (Vide Russ " Handbuch für Vogelliebhaber," p. 176).

In 1904 Mr. W. Fasey became the owner of a pair of this species, imported by Jamrach, and in 1905 the Rev. Hubert D. Astley secured four specimens from a consignment of Australian birds on board a ship touching at Genoa on its way to England; he subsequently gave an account of the species, illustrated by a coloured plate drawn by himself, in *The Avicultural Magazine*, Second Series, Vol. III., pp. 239-242. Mr. Astley says: " The male bird has a pretty warbling song, somewhat after the warble of a Budgerigar, but softer, with no shrill interludes, and the call note is also like a Budgerigar's, but softer again.

" Indeed, had I not had wiser and more learned people to guide me, I should have thought that the Bourke's and the Budgerigar were connected more closely than in merely being Grass-Parrakeets. There are the same scaly-looking feathers on the wings; the same manner of the male in sitting with his head close to his mate's, and warbling for half-an-hour at a time; the same way, too, of rapid fluttering of wings with that whistling sound, whilst they hold to a perch with their feet."

Gould observes (" Handbook to the Birds of Australia," Vol. II., p. 80): " It is particularly interesting, as exhibiting, in the crescentic form of the markings on the back, an approach to the style of colouring observable in the single species of the genus *Melopsittacus* (*M. undulatus*)." Why is it interesting, if there is no affinity between the two birds? When one considers upon what comparatively slight external

characters many of the genera of the Parrakeets are separated, surely there can be no insuperable difficulty in admitting that individual species, arbitrarily placed in different genera for purposes of classification, may be really more nearly related to each other than to their congeners, according to formula.*

A pair of Bourke's Parrakeets, probably from the same consignment from which Mr. Astley procured his specimens, reached the London Zoological Gardens early in 1905; one of them, however, died almost immediately. In April, however, a second consignment appears to have reached Mr. Hamlyn, from which Mr. W. R. Fasey secured six specimens, and in *The Avicultural Magazine* for the following year (Second Series, Vol. IV., pp. 276-277) he records his success in breeding the species. He says: "They appear to be easy to breed, and sit very steadily, the hen never leaving the nest even when I have tried to disturb her." He adds: "Neither these birds nor any of the Grass Parrakeets (excepting the Budgerigar) can stand much cold; and I am of opinion they cannot be kept alive for any lengthy period without growing grass to eat." The first nest produced two young birds, the second five; and the hen then went to nest again.

In opposition to the opinion that Bourke's Parrakeets are unable to stand cold we read (*The Avicultural Magazine*, Second Series, Vol. V., p. 232) that at Benham Park five specimens lived out in an unheated aviary all the winter, and looked in very good trim.

In 1907 Mr. Seth-Smith paired two hen Bourke's Parrakeets to one cock; the hens laid in separate logs in the same aviary, one nest resulting in four young birds, the other in two. Three of the young, however, were killed by the damp weather which prevailed at the time.

The first example of this species to arrive at the Regent's Park Gardens was purchased in 1867; in 1869 half a dozen were added.

Blue-winged Grass Parrakeet (*Neophema venusta*).

Above brownish olive-green; upper wing-coverts blue; primary-coverts and primaries black, the latter with blue edges to the outer webs; inner webs of secondaries black; four middle tail-feathers greenish-blue; the rest black at base of inner webs, and blue at base of outer webs, otherwise yellow; forehead crossed by a band of deep indigo-blue, edged above with pale blue; lores and region behind the eye yellow; throat, chest, and flanks pale brownish olive-green; abdomen and under tail-coverts yellow; middle of abdomen brighter; under wing-coverts deep blue; beak, feet, and irides brown. Female duller in colouring than the male. Hab., "New South Wales, South Australia, and Tasmania." (Salvadori.)

A. J. North says ("Catalogue of Nests and Eggs," pp. 262, 263): "This beautiful species is found breeding in the hollow branches of the eucalyptus and other trees. An average specimen of the eggs taken from the bottom of a hollow stump in which the female was captured while sitting is white, and the shell smooth, and measures—length 0.85 × 0.67 in. Eggs usually five for a sitting. The breeding season commences in September, and lasts the three following months."

According to Robert Hall ("Victorian Naturalist," 1898): "A field of standing oats is much appreciated by this species; failing this, milk thistle and flat weed (*Hypocharis*, sp.) seed come next in favour."

According to Mr. Seth-Smith ("Parrakeets," p. 216), this bird "is very seldom imported into this country nowadays, although at one time it was occasionally to be obtained. It very closely resembles the *Neophema elegans*, both species passing with bird dealers as 'Elegant Parrakeets.'"

Russ says: "Since 1881 frequently imported, particularly from London," which may perhaps account for it not being on sale in the London market. He continues: "Bred several times since 1882 by Baron von Cornely at his castle of Beaujardin, near Tours. Price 20-30 marks for a pair."

This species has been represented in the collection exhibited at Regent's Park, but not of late years.

Elegant Grass Parrakeet (*Neophema elegans*).

The upper parts of this Parrakeet are dark green with a golden gloss, and the under parts olive-green; the frontal band to behind the eye, the edge of the wing and lesser-coverts are blue; the belly yellow, acquiring a saffron central patch with age; the beak black with whitish lower edge to the upper mandible; the feet brown; the iris reddish or dark brown. Russ describes the female as "dingier; the forehead, face, and wings with the same pattern, but more restricted and duller; the abdominal patch and shoulder patch not present." Salvadori says: "Like the male, but duller and smaller (Gould); and, according to Reichenow, with the frontal blue band narrower." Seth-Smith says: "Differs from the male only in being slightly smaller and duller. I found the sexed females smaller, with a considerably shorter beak, duller in colour, and with a narrower frontal blue band." Hab., Southern Australia, from New South Wales to Western Australia.

Gould says that this bird appears to prefer the barren and sandy belts bordering the coast, but occasionally resorts to the more distant interior. Flocks were constantly rising before me while traversing the salt marshes, which stretched along the coast from Holdfast Bay to the Port of Adelaide; they were feeding upon the seeds of grasses and various other plants, which were there abundant. In the middle of the day, or when disturbed, they retreated to the thick Banksias that grow on the sandy ridges in the immediate neighbourhood, and in such numbers that I have seen those trees literally covered with them, intermingled with the orange-breasted species (*E. aurantia*), which, however, was far less numerous. When they rise they spread out and display their beautiful yellow tail feathers to the greatest advantage.

Gilbert informed me that in Western Australia "the Elegant Grass Parrakeet inhabits every variety of situation, but particularly where there is an abundance of grass, the seeds of which are its favourite food; it may be generally observed in small families, but at Kojenup, where there are several pools, and no other water for many miles round, I saw these birds in myriads; but although I shot a great many, they were nearly all young birds. Its flight is rapid and even, and frequently at considerable altitudes. The breeding season is in September and October, the eggs being from four to seven in number, of a pure white, eleven lines long by eight and a half lines broad."

Dr. Russ says that this bird has a soft, pleasing song, as Alexander von Homeyer first made known. It endures captivity admirably, has freely nested in Belgium and Holland, and in the London Zoological Gardens in 1879 hybrids were bred between it and the Turquoisine.

Mr. John Sergeant published notes on the breeding of this species in one of his aviaries in *The Avicultural Magazine*, First Series, Vol. II., p. 98. He says that

* Like the Budgerigar, Bourke's Parrakeet is sometimes affected by what is known as "French moult."

incubation lasts eighteen days, and the young appear in about twenty-eight days.

Unfortunately, this species is rarely to be seen in the London market nowadays. It first reached the London Zoological Society's Gardens in 1862, and continued to be received from time to time up to 1887.

Orange-bellied Grass Parrakeet (*Neophema chrysogastra*).

Above grass-green; lesser wing-coverts, carpal coverts, anterior greater-coverts, primary-coverts, and outer webs of primaries deep blue, the outer webs of the latter, however, tinged with greenish towards the tip; two central tail-feathers bluish-green, bluer towards the tip; the next pair similar but with black margins to the inner webs; the rest greenish-blue on outer, black on inner webs and broadly tipped with bright yellow; frontal band blue with a paler edging on both sides; lores, cheeks, and breast yellowish-green, becoming greenish yellow on the abdomen; a large central abdominal orange patch; under tail-coverts yellow; under wing-coverts deep blue; beak dark brown, paler below; feet dull brown; irides dark brown. Female smaller and duller, with the orange abdominal patch more restricted and less brilliant. Hab., "South-Eastern Australia, from the Clarence River District to Victoria, and Tasmania; very abundant on the Actæon Islands" (Salvadori).

Gould says ("Handbook," Vol. II., p. 75):—"I observed it sparingly dispersed in the neighbourhood of Hobart Town and New Norfolk, but found it in far greater abundance on the Actæon Islands, at the entrance of D'Entrecasteaux Channel. These small and uninhabited islands are covered with grasses and scrub, intermingled with a species of Barilla, nearly allied to *Atriplex* halimus; and almost the only land-bird that enlivens these solitary spots is the present beautiful Parrakeet. I frequently flushed small flocks from among the grass, when they almost immediately alighted on the Barilla bushes around me, their sparkling orange bellies forming a striking contrast with the green of the other parts of their plumage and the silvery foliage of the plant upon which they rested. I made many unsuccessful attempts to discover their breeding-places; as, however, these islands are destitute of large trees, I am induced to believe that they lay eggs in holes on the ground, or among the stones on the shore. On visiting South Australia in winter, I there found it equally abundant on the flat, marshy grounds bordering the coast, especially between the Port of Adelaide and Holdfast Bay."

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," p. 652) says:—"Mr. A. E. Brent informs me that this bird usually lays late in the season (December), depositing its eggs in a small broken spout of a fallen tree." He thus describes the nidification:—"*Nest.*—Usually within a small hollow spout of a fallen tree or log. *Eggs.*—Clutch, four to six; round in form; texture of shell fine; surface slightly glossy; colour pure white. Dimensions in inches of a pair: (1) .84 × .73, (2) .83 × .75; three from a set taken near Ross, Tasmania: (1) .86 × .74, (2) .84 × .7, (3) .82 × .7."

Russ says of it:—"Very rare in the market; imported by J. Abrahams, of London."

Four examples were purchased for the London Zoological Gardens in 1873.

Rock Grass-Parrakeet (*Neophema petrophila*).

Above dull olive-green; smaller upper wing-coverts near bend of wing and outer coverts verditer-blue; outer greater coverts blue; bastard-wing, primary-coverts, and outer webs of primaries deep blue, the latter more or less greenish towards tips; inner webs of primaries brownish-black; central tail-feathers bluish-green, the rest bluish-green at base, the inner webs brownish-black, the tips broadly bright yellow; frontal band deep indigo-blue, edged on both sides with dull verditer blue; lores and orbital ring dull verditer blue; under surface more yellowish than above, especially on the abdomen, which is often slightly tinged with orange in the centre; under tail-coverts yellow; upper mandible deep reddish-brown, lower mandible pale yellow at the sides, bluish-grey at the tip; feet dark brownish-grey; irides very dark brown. Female not differentiated. Hab., South-Western Australia.

Gould says ("Handbook," Vol. II., pp. 76, 77):—"It occurs in great numbers on Rottnest and other islands near Swan River." 'Here,' says Gilbert, 'it breeds in the holes of the most precipitous cliffs, choosing in preference those facing the water and most difficult of access; and hence it required no slight degree of exertion to procure examples of the eggs, which, according to the testimony of the natives, are white, and seven or eight in number.

"'Its flight is extremely rapid, and at times it mounts to a great height in the air.'"

Mr. A. J. Campbell ("Nests and Eggs," p. 653) says:—"It is a rare picture to witness a pair of these lovable little creatures in their golden-green plumage, perched on the face of a limestone crag, amidst such romantic and rugged surroundings. I was singularly successful in securing a series of their eggs at Rottnest Island, where the birds invariably select rocky islets off the main island for breeding purposes, notably Green and Parrakeet Islands.

"By a curious coincidence the first person on the island to present me with specimens of both eggs and live birds was Mr. A. H. Courderòt, a corresponding member of the Society before which I described the eggs, viz., the Royal Society of Victoria. Other eggs I took myself. The birds make no nest, but simply deposit four or five eggs under the slabs of indurated sand or limestone, where the eggs are sometimes very difficult to reach, especially if a crevice on a steep side sloping to the water's edge be selected." He thus describes the nidification:—"*Nest.*—In a crevice of a rock or under shelving stones, usually on islets adjacent to the mainland." "*Eggs.*—Clutch, four to five; some roundish, others elliptical in shape; texture of shell fine; surface glossy; colour, pure white. Dimensions in inches of a proper clutch: (1) 1.0 × .75, (2) .98 × .78, (3) .96 × .75, (4) .95 × .76. The eggs of the Rock Parrakeet appear to be the largest of the genus."

Mr. Seth-Smith rightly conjectured that this Parrakeet had been imported into England; though the specimens were sent to the Continent. Russ says:—"A pair from Abrahams in my birdroom sat for several months in a cage together with young Rose-headed Parrakeets, and also fed with pleasure on the following, prepared for the latter:—Cooked rice, egg-bread, sweet fruit, etc.; the female took possession of a Starling nest-box, which chanced to be in the cage, and one day a young (Rock Parrakeet) flew out; two rotten eggs were left in the nest. Young plumage:—Above fawn-greyish olive-green, below clear olive-green (without yellow tinge); cheeks and ear-region yellowish-green; the blue-frontal band only narrow and ill-defined (loral and orbital ring wanting); beak brownish horn-grey; eyes black; feet brownish-grey. The following year the pair laid four eggs in the nest-box, which unhappily were infertile."

Turquoisine Grass-Parrakeet.
(Neophema pulchella.)

The forehead, a stripe over the eye the cheeks, shoulders, and lesser wing-coverts of a bright metallic greenish blue; the crown of the head, back of neck, upper surface and flanks bright olive green; at the insertion of the wings is a bright patch of chestnut red; the primaries and secondaries are deep blue on their outer, but blackish-brown on their inner, webs; the lower breast, abdomen, and under tail-coverts are bright yellow; the four central tail-feathers are green; the remainder, however, are largely tipped with yellow; the beak and legs are dark brown. Female smaller and duller, with a thicker, shorter beak; frontal band blue passing over and behind the eye; a line in front of the frontal band and the lores pale yellowish; cheeks with a blue tinge; no chestnut red patch on the inner upper wing-coverts; throat and breast yellowish-green. Hab., South-eastern Australia, from Wide Bay to Victoria.

Mr. Gould was not fortunate enough to discover the nest of this species; but he was informed that it laid eight white eggs in a hole in a tree. He says that when flushed it flies off to a short distance between the trees, perches on some dead branch, and remains there until hunger impels it to return to the ground." Unlike many of the Parrakeets, the Turquoisine does not appear to travel in large companies, but usually in little bands consisting of from six to eight individuals; it is essentially a seed-eating bird, and therefore, so soon as it has got over the effects of its journey to this country, there is no difficulty in keeping it on a diet of white millet and canaryseed. Moreover, in a cool aviary, there should be every chance of breeding from a pair, as Dr. Russ assures us that the Turquoisine is a "ravishing little bird" and amiable.

This species was bred in the Zoological Gardens at Antwerp in 1861, subsequently by Leuckfeld, of Nordhausen, and later in numerous other bird-rooms, even to the fourth generation. The pair, according to Russ, sit motionless, apparently tired and sleepy, but only until the birds become tame and confiding. Being crepuscular birds, he says that they only become lively in the evening, but at the nesting season they develop an active disposition. The affection of the couple is extremely hearty. The male then utters a whistling prattle, a sort of little not unpleasant song. The clutch consists of from four to eight eggs. Incubation lasts twenty to twenty-two days. The female alone incubates, the young being fed by the male; later both sexes feed them. The young plumage closely resembles that of the adult female, above soft yellowish grey, below greyish; the male, if vigorous, even when it leaves the nest with a delicate purplish-brown shoulder spot; beak, silver white; eyes, black; feet, bluish white. The change of colour takes place after nine months.

Mr. Seth-Smith says ("Parrakeets," p. 225) :—"The Turquoisine is at the present time extremely rare in this country, although it appears to have been imported somewhat frequently years ago; and it has bred in captivity in this country and on the Continent on numerous occasions. In the London Zoological Gardens alone numbers were bred between the years 1860 and 1883, but for several years past no specimen has been exhibited there."

This author also tells us that this desirable bird "is one of the gentlest of Parrots, and may be trusted with birds much smaller and weaker than itself."

Splendid Grass-Parrakeet.
(Neophema splendida.)

Above grass-green; upper wing-coverts pale blue; primary coverts and primaries black, slightly bluish, the last with the outer edges greenish towards the tip; secondaries blue tinged with green, the innermost quite green; two central tail-feathers dark green; the next pair black on inner and green on outer web and broadly tipped with bright yellow extending more and more from within outwards; face, ear-coverts, and sides of neck blue, darker on forehead and cheeks; back of head and nape green washed with blue; breast bright scarlet; sides green; abdomen and under tail-coverts yellow; under wing-coverts deep indigo blue; beak black; feet brown. Female apparently with a slightly broader beak; colouring much duller; face and upper wing-coverts pale lazuline blue; no scarlet on the breast, which is green, and the upper surface, including the crown and nape green tinged with orange. Hab., Southern Australia from New South Wales to S. Western Australia.

Mr. Gould remarks that it differs from the chestnut-shouldered bird "by the entire absence of the chestnut mark on the shoulders, the more intense blue of the face, and the gorgeous colouring of the chest." Like all the Grass Parrakeets, the Splendid Parrakeet passes much of its time on the ground in its own country, where, owing to the protective green colouring of its upper parts, it is inconspicuous, but when flushed there is immediately, as Gould observes, "a brilliant display of blue, red, and yellow on its face, breast, and abdomen." It nests, like its congeners, in a hollow branch, laying from three to four white eggs. Incubation lasts about eighteen days. This beautiful bird unfortunately is rarely imported; otherwise, as it is quite hardy, there might be some hope of breeding it in our aviaries. Being a Grass Parrakeet there is no difficulty in feeding it, millet, canary, and oats, together with grass and other wild weed-seeds, being sufficient to keep it in health, a little green food being also acceptable.

A pair of this species reached the London Zoological Gardens in 1871, and a young one was hatched in the Gardens in the year following; another example was also purchased in the same year; but it is practically unknown to aviculturists, and is, as Russ says, one of the rarest in the market.

The genus *Cyanorhamphus* is characterised by the shining pearl-grey base of the upper mandible combined with the absence of a crest (which distinguishes it from *Nymphicus*.) The species have long tarsi, and spend much of their time on the ground feeding upon seeds. In captivity Mr. Seth-Smith says they should be fed upon "canary, millet, and hemp seed and ripe fruit; green food, such as chickweed and groundsel, should also be given in the summer time."

Antipodes Island Parrakeet.
(Cyanorhamphus unicolor).

Above olive-green, paler or yellowish on the rump; bastard-wing and primary-coverts with bluish green inner and bright blue outer webs; primaries tinged with blue; tail dull green; forehead, sides of head, and ear-coverts brighter green; under surface yellowish-green; flights below greyish-brown; tail below dull golden olive; beak black, pearly-grey at base of upper mandible; feet brown. Female smaller and paler than the male, the beak greyish-white, with the terminal portion of the upper mandible brownish-black; a

clouded bluish spot in front of each nostril. Hab., Antipodes Island.

According to the late Sir Walter Buller, "Captain Fairchild, who is an excellent observer, reports that on Antipodes Island he found it inhabiting a plateau 1,320 feet above the sea. It was very tame, and easily caught. He never saw it take wing, which he attributes as much to the boisterous winds that sweep over this exposed island as to its naturally feeble powers of flight. It habitually walks and climbs among the tussock-grass, reminding one of the habits of the Australian Ground-Parrot (*Pezoporus formosus*)." (Cf. "Birds of New Zealand," Second Edition, I., pp. 145, 148.) This is perhaps the largest species of the genus, measuring from 13 in. to 14¼ in. in length. Russ appears to have had no knowledge of it as a cage-bird, but it had probably never been imported when he wrote his Handbook. The London Zoological Society received four specimens in 1894 and 1895.

New Zealand Parrakeet. (*Cyanorhamphus novæ Zealandiæ*).

Green; a broad concealed yellowish-white marking on the nape; a more or less defined dark crimson spot on each side of the rump; front edge of wing blue; flights dull black, the outer primaries with their coverts and the bastard-wing with bright blue outer webs; forehead, crown, and a streak crossing the eye on to the ear-coverts deep crimson; under surface paler green; under wing-coverts bluish-green; flights below paler black than above; tail below dull golden olive; upper mandible bluish-white, tipped with black; lower mandible bluish-black; feet pale brown; irides cherry-red. Female smaller and with less conspicuous crimson frontal cap. Hab., New Zealand.

The late Sir Walter Buller says of this species: "It frequents every part of the bush, but appears to prefer the outskirts, where the vegetation is low and scrubby, as also the wooded margins of creeks and rivers. It is often met with among the dense koromiko (*Veronica*), which covers the low river-flats, or among the bushes of *Leptospermum* and other scrub. It seldom ventures beyond the shelter of the woods, unless it be to visit the farmer's fields for its tithe of grain, or to reach some distant feeding-place, when it rises rather high in the air and flies rapidly, but in a rather zigzag course. When on the wing it utters a hurried chattering note; and when alarmed, or calling to its fellows, it emits a cry resembling the words 'twenty-eight,' with a slight emphasis on the last syllable. It often resorts to the tops of the highest trees, but may always be enticed downwards by imitating this note. It is gregarious, forming parties of from three to twelve, or more, in number, except in the breeding season, when it is generally met with in pairs.

"Its food consists chiefly of berries and seeds; but I suspect that it devours small insects and their larvæ; for I have observed flocks of a dozen or more on the ground, engaged apparently in a search of that kind.

"A hole in a decaying or dead tree affords this species a natural breeding-place, the eggs being laid on the pulverised rotten wood at the bottom; for there is no further attempt at forming a nest. The months of November and December constitute the breeding season. The eggs vary in number from three to seven. . . . Although exhibiting a preference for hollow trees, they sometimes nest in the holes or crevices of rocks. On the Upper Wanganui the natives pointed out to me a small round cavity in the perpendicular cliff forming the bank of the river, and assured me that this was the entrance to a small chamber where a pair of Parrakeets had reared their young in security for years. The eggs are very broadly oval, measuring 1.05 by .83. They are pure white, and are very finely granulated on the surface, sometimes with minute limy excrescences near the thicker end."

Although, like most New Zealand birds, this species is now seldom (if ever) imported, it is a species so easily bred in captivity that home-bred birds may sometimes be secured; it is not dangerous to other species, and therefore is a desirable inhabitant of the aviary. Russ says that it was first bred by Fiedler, of Agram, in 1872, it also went to nest twice with him in 1878, and has been freely bred in Belgium and France. Delaurier, of Angouléme, reared thirty-eight young from one pair in succession. Clutch 3-5 eggs; the female incubates alone for twenty-four days; several broods every year. Mr. Seth-Smith had a pair for a short time, but unfortunately the hen died. The London Zoological Society first purchased the species in 1864, and secured several other examples in later years.

Saisset's Parrakeet (*Cyanorhamphus saisseti*).

Larger than the preceding, and with a longer tail; the flights of a brighter blue and the tail bluish towards the tips and with the tips yellowish; cheeks and throat more distinctly yellow; under surface greenish-yellow; beak blackish leaden, bluish grey at base of upper mandible; feet greyish-brown. Female smaller than the male. Hab., New Caledonia.

This is a local race of the New Zealand Parrakeet. According to E. L. Layard (*The Ibis*, 1882, p. 524): "It is very partial to the ripe fruit of the pawpaw, tearing away the melon-like pulp to arrive at the pungent seeds within."

An example of this species reached the London Zoological Gardens in 1882.

Golden-crowned Parrakeet (*Cyanorhamphus auriceps*).

Grass-green; a concealed yellowish white spot on the nape; a crimson spot on each side of the rump; flights dull black; bastard wing, primary-coverts, and the second to fifth primaries at base of outer web, indigo-blue, the latter also edged with green; frontal band continued on each side to the eye, crimson; crown golden yellow; under surface more yellow than the upper surface; under surface of flights sometimes (perhaps only in young birds) crossed by a pale yellow band; tail below golden olive; upper mandible bluish-white at base, black towards the tip; lower mandible bluish-black; feet pale brown (Buller); bill blackish-grey, feet yellowish-brown; irides red (Hutton). Female smaller than the male. Hab., North and South Islands of New Zealand and Chatham Islands. The late Sir Walter Buller says that this Parrakeet is seen generally in pairs, it "loves to frequent the tutu bushes (*Coriaria ruscifolia*), to regale itself on the juicy berries of this bushy shrub; and on these occasions it is easily snared by the natives, who use for that purpose a flat noose at the end of a slender rod. When feeding on the tutu-berry the whole of the interior becomes stained of a dark purple. When the wild dock has run to seed this pretty little Parrakeet repairs to the open fields and feasts on the ripe seeds of that noxious weed. At other seasons the berries of *Coprosma lucida*, *Fuchsia excorticata*, and other forest-shrubs afford it a plentiful and agreeable nutriment."

"Like its congener, it nests in hollow trees, and lays from five to eight eggs, resembling those of *Platycercus novæ zealandiæ*, but smaller. Specimens in

my collection measure .9 in. in length by .75 in. in breadth."

A full account of his experience of this species in captivity was published by Mr. G. E. Bouskill, in *The Avicultural Magazine*, First Series, Vol. IV., pp. 45, 46. The birds paired, and the hen laid five eggs and began to sit. From further notes (pp. 77, 78) it appears that a sort of nest of fibre was formed inside a cocoanut-husk; the female alone incubated, about twenty-one days from the laying of the first egg; the nestling-down of the newly-hatched young was dirty yellow; when about fourteen days old the young began to feather, and they were fully fledged when about a month old; they left the nest when five weeks old. The young plumage chiefly differed from that of the parents in the barely perceptible crimson frontal band, the golden yellow patch less bright, the red under the wings barely indicated, the beak flesh-colour, rather darker at tip. They were reared on canary, hemp, and millet, about thirty to forty mealworms daily and stale bread soaked in cold water and then squeezed nearly dry.

Russ says it was bred in 1872 by Fiedler in Agram and then by himself; in 1883 also by Delaurier of Angoulème. He adds that it is only occasionally in the market; its price uncertain. It was first purchased for the Regent's Park Gardens in 1865, and the last recorded in the ninth edition of the "List of Animals" was a pair purchased in 1890.

Alpine Parrakeet (*Cyanorhamphus malherbei*).

Smaller than the preceding, the frontal band orange, the crown very pale yellow; spot on sides of rump orange; under surface pale green, not yellowish; tail below dull grey, not olivaceous; beak bluish-black, silvery-bluish at base of upper mandible; feet pale brown. Female probably smaller than the male. Hab., North Island (Reischek) and South Island, New Zealand.

According to the late Sir Walter Buller, this species frequents "the alpine scrub, in pairs or in small parties, and is very tame and fearless. It is by no means uncommon in the wooded hills surrounding Nelson." He was of opinion that it did not exist on any part of the North Island, but this is now known to be an error. (Cf. *The Ibis*, 1907, p. 317.)

According to Dr. Russ, Delaurier bred four young of this rare species in 1883. It was purchased (two specimens) by the London Zoological Society in 1872.

The Horned Parrakeets (*Nymphicus*) are chiefly distinguished by the singular crest on the front of the head; they are rarely imported and difficult to keep alive owing to the fact that their treatment in captivity seems not to be understood. Russ says they should have all kinds of green food, chiefly salad; gradually, after millet, canary, and hemp, it may be accustomed to all kinds of other seeds, fresh ants' cocoons or ant-cocoon mixture, with egg-bread, etc., also service berries, a little apple, and mealworms. I should fight shy of service berries myself, and also of egg-bread; I think sponge-cake would be safer.

Horned Parrakeet (*Nymphicus cornutus*).

Green, yellower on the under than the upper parts; the singular crest consists of long black feathers tipped with crimson; two of these feathers are immensely elongated, and curve upwards and forwards from just behind the middle of the crown, whilst two shorter ones project backwards from the posterior part of the crest; the face and chin are covered by a black mask enclosing the eyes; the nape and ear-coverts golden yellow; bastard wing, primary coverts, and outer webs of primaries deep blue; inner webs and undersides of quills black; rump washed with yellow; tail blue above, but with green base and pale tip, blackish with greyish tips below; beak black, bluish on culmen; feet grey-brown; naked skin round eye brownish; iris amber, reddish externally. Female smaller, duller in colouring, with rather narrower and less tapered beak. The young have the nape and ear-coverts washed with green, and the pale tips to the tail feathers are somewhat yellowish. Hab., New Caledonia.

E. L. Layard says (*The Ibis*, 1882, p. 524): "This crested Parrot, which is peculiar to New Caledonia, is found in all the forest region, frequenting trees in flower or fruit. It usually flies in pairs, though often several pairs may be found feeding on the same tree. They are very partial to the candle nut fruit and to the blossoms of the *Erythrina*. We have seen them on the ground on fallen fruits and berries, but they do not usually resort thither. They nest in holes in trees, and we obtained their eggs on October 15. They are dirty white, rough, four in number, similarly shaped at each end, and much rounded; axis 12, diameter 10."

An illustration of the head of this species, together with that of *N. uvæensis* was published by the Messrs. Layard in the "Proceedings of the Zoological Society" for 1882. Plate XXVI.

In *The Avicultural Magazine*, First Series, Vol. VI., the Hon. and Rev. Canon Dutton says: "The species that beats me is *Nymphicus*. To look at their bills you would say they were seed-eaters; but I bought a lot of eight once, which looked healthy enough. They all died, one after the other, of digestive troubles. And I have had other specimens, which I have kept for twelve months or so, but then they have died. They have never been kept very long in the Zoological Gardens. I cannot but think they would live longer, if we knew how to feed them correctly."

It would seem that in Germany this and the following species are not regarded as delicate. In 1882 Baron von Cornely bred three hybrids between this and the Uvæan Parrakeet.

In 1882 Layard brought home living examples of this species, which were placed in the London Zoological Gardens, and Abrahams imported it later.

Uvæan Parrakeet (*Nymphicus uvæensis*).

Grass-green, the rump yellower; bastard wing, primary-coverts, and outer webs of primaries blue; tail green, changing to blue towards the tip; the three lateral feathers blue, paler at tips, and with very little green at base; long frontal red-tipped feathers and crest dark green, the latter consisting of six up-curved paler tipped feathers; face, cheeks, and chin dark green; under surface yellowish-green; bill black, bluish at base of upper mandible; feet black; irides orange. Female duller in colouring, with more slender beak, especially towards the tip, but noticeably shorter. Hab., Uvéa, and perhaps Lifu, Loyalty Islands. I have found no notes on the wild life of this species; it was brought over alive by Layard and deposited in the London Zoological Gardens. According to Mr. Seth-Smith, it is more freely imported than the Horned Parrakeet, but is regarded as equally delicate. Russ tells us that Baron von Cornely succeeded in breeding it, after breeding the hybrids previously noted; so that it is evident that these birds are understood on the Continent.

Swift Parrakeet (*Nanodes discolor*).*

In the adult male the prevailing colour of this bird is bright green; the forehead, throat, and under wing-

* This being a brush-tongued bird, with the habits of a Lorikeet, should be treated in captivity in the same manner.

coverts, and a contiguous patch on the sides, are bright red; the crown of the head is black, shading into blue; the shoulders and base of the primaries are also blue; the tail is deep red, shading into blue towards the tip; the under parts are yellowish-green; the beak is yellowish, the legs are grey. Female smaller and duller, with narrower beak, but with a broader and shorter terminal hook. Hab., South-Eastern Australia, from the Wide Bay district to Victoria and Tasmania.

Gould says that it is "a migratory species, passing the summer and breeding season only in the more southern parts of the Australian Continent and Tasmania, and retiring northwards for the remainder of the year. During September and the four following months it is not only abundant in all the gum forests of Tasmania, but is very common in the shrubberies and gardens at Hobart Town. It is frequently to be seen on the gum-trees bordering the streets, within a few feet of the heads of the passing inhabitants, and so intent upon gathering the honey from the fresh-blown flowers which daily expand, as almost entirely to disregard their presence. The tree to which it is so eagerly attracted is the *Eucalyptus gibbosus*, cultivated specimens of which appear to have finer blossoms than those in their native forests. It is certainly the finest of the *Eucalypti* I have ever seen, and when its pendent branches are covered with thick clusters of pale yellow blossoms, presents a most beautiful appearance; these blossoms are so charged with saccharine matter that the birds soon fill themselves with honey, even to their very throats; several of those I shot, upon being held up by their feet, discharged from their months a stream of this liquid to the amount of a dessertspoonful. Small flocks of from four to twenty in number are also frequently to be seen passing over the town, chasing each other, like the Swift of Europe, whence in all probability has arisen its Colonial name. Sometimes these flights appear to be taken for the sake of exercise, or in mere playfulness of disposition, while at others the birds are passing from one garden to another, or proceeding from the town to the forests at the foot of Mount Wellington, or *vice versâ*. Their plumage so closely assimilates in colour to the leaves of the trees they frequent, and they, moreover, creep so quietly yet actively from branch to branch, clinging in every possible position, that were it not for their movements and the trembling of the leaves, it would be difficult to perceive them without a minute examination of the tree upon which they have alighted. I found them breeding about midway between Hobart Town and Brown's River, but was not fortunate enough to obtain their eggs, in consequence of their being laid in holes of the loftiest and most inaccessible trees. They are said to be two in number, and perfectly white."

Russ says that "since 1879 this species has been imported now and again during the spring months in several pairs, at other times rarely. If accustomed to seeds it is long lived. Altogether an amiable room companion. In the bird-room gentle and graceful, yet always restless, and quarrelsome towards all other inhabitants. It has not the deafening cry of the Mountain Lory, only occasionally the male cries tolerably shrilly as he sits on a branch with a peculiar fluttering of his beautifully-coloured wings. Male and female, the latter more softly, possess a pleasing yet little varying singing utterance. They are fond of climbing, fly little. Close cage-bars are necessary, because they recklessly force their heads through. Not yet bred."

It is a question whether this bird should not have been regarded as an aberrant form of the family *Loriidæ*, to which it exhibits strong affinity. The first two specimens to reach the London Zoological Gardens were purchased in 1863, the last pair (recorded in the ninth edition of the List of Animals) in 1884.

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The genus *Melopsittacus* has narrow and pointed tail-feathers, and the upper mandible is not notched; it contains one species, the Budgerigar, which in captivity can be kept upon canaryseed alone, but I think it does better when supplied also with millet and a few oats. When breeding bread soaked in cold water and then squeezed as dry as possible, should be given, as well as chickweed or grass in flower.

BUDGERIGAR (*Melopsittacus undulatus*).

The cock bird has the crown of the head cowslip-yellow; the back of the head, cheeks, mantle, and wing-coverts greyish yellow barred with black, the feathers of the shoulder being slightly tinged with emerald green here and there; the chin and throat bright sulphur yellow. An irregular streak composed of ultramarine blue and black spots separates the barred grey of the cheek from the bright yellow of the throat; this streak is followed at the back of the throat by two or three lateral black spots; the breast, belly, thighs, and under tail-coverts are of the most intensely

brilliant emerald green colour; the back and upper tail-coverts are of a similar, but slightly bluer, green; primaries deep grey, edged yellow, and with greenish outer web; the two middle tail-feathers are deep blue, slightly greenish towards the base, the remainder bright yellow, broadly tipped with dull blue shading into peacock-green, the borders of the outer web also washed with pale emerald-green; the cere, in the breeding season, is bright blue, but after that season it becomes much dulled (so that the inexperienced at this time sometimes mistake cocks for hens); the beak is white and the legs grey, irides straw whitish. The hen has a slightly shorter beak, the cere being pale blue with white borders when not breeding, but this changes to a coffee-brown colour in the breeding season; the head is paler, the crown being pale primrose yellow, and the sides of head and throat slightly less vivid, the black barring is not quite so sharply defined, and the green of the under-parts is just perceptibly yellower. Hab., Australia from the Gulf of Carpentaria and Port Denison on the East, through the interior, to New South Wales, Victoria, West and South-West Australia.

This well-known and abundant little Parrot is sometimes called the "Undulated Grass Parrakeet."

Gould says ("Handbook," Vol. II., pp. 82, 83):—"On arriving at Brezi, to the north of the Liverpool Plains, in the beginning of December, I found myself surrounded by numbers, breeding in all the hollow spouts of the large *Eucalypti* bordering the Mokai; and on crossing the plains between that river and the Peel,

in the direction of the Turi Mountain, I saw them in flocks of thousands. Their flight is remarkably straight and rapid, and is generally accompanied by a screeching noise. During the heat of the day, when flocks of them are sitting motionless among the leaves of the gum-trees, they are with difficulty detected.

"The breeding season is at its height in December, and by the end of the month the young are generally capable of providing for themselves. The eggs are three or four in number, pure white, nine lines long by seven lines in diameter, and are deposited in the holes and spouts of the gum-trees without any nests."

"In a state of nature they feed exclusively upon grass-seeds, with which their crops are always found crammed; in confinement they thrive equally well upon canaryseed."

This is one of the commonest, and certainly the most freely imported, of all the Australian Parrakeets; it is also largely bred in aviaries throughout civilised Europe. In captivity it breeds at any time, provided that the cere is properly coloured (which indicates its fitness for breeding). At liberty it lays three to four eggs; but in cage or aviary it lays four or five on alternate days. The birds are fit to breed when about a year old. To breed Budgerigars successfully several pairs should be turned into an aviary by themselves. In the second place, the aviary should be a cool one, outdoors for preference, as, for hardy birds like Undulated Grass Parrakeets, artificial heat is not only unnecessary, but is enervating. Then there should be plenty of nesting places—such as log-nests, cocoa-nut husks, or square boxes with a hole at the side, and a half cocoa-nut-shell cemented on the bottom. At least three pairs should be turned in together, so that the example of one pair may stimulate the other, and also that the stock may not be weakened by too much inbreeding, thereby losing its feathers and becoming a hideous eyesore; this state of things has, without rhyme or reason, been called "a French moult." There is perhaps one advantage in inbreeding, for the yellow variety, which, though less beautiful and more delicate, is considered more valuable, has originated in this way; as with the albino forms of some of our British Birds (which naturally inbreed if too strictly protected) this form does sometimes occur in a wild state. The much rarer blue form, which the late Mr. Abrahams thought was likewise a result of inbreeding, is more probably the result of just the opposite treatment, and should be extremely vigorous. I have never seen this form, but it was well known to Mr. Abrahams.

The Budgerigar is a lively little bird, and his action when courting is very comical; for he stands facing his hen, singing his chuckling little song and bobbing his head up and down with a circular motion, as if trying to indicate a halo round her face—doubtless a form of worship!—then suddenly he flies round in a circle alighting again in the same place and repeating the process. I purchased three pairs of this species in 1892, and in the winter of 1892-3 they went to nest, and, although one hen died and the widower killed several youngsters of other nests, nine young ones were successfully reared. The result of breeding in the frosty weather was that none of these young birds were ever vigorous, and during 1893 they dropped off one by one until by the end of the year only one survived. I therefore strongly advise intending breeders not to attempt to rear young in a cold aviary during the winter months.

Both sexes of the Budgerigar bite severely, but the hen, as Mr. Abrahams informed me, draws blood when she bites: therefore, if you purchase your birds after the breeding season, you have nothing to do but let every specimen bite you, and the first which draws blood will be a hen; the fingers of that enthusiastic naturalist were terribly scarred with the frequent bites of this and other Parrots which he handled in the interests of his business. I remember picking up one of my hens one day when she was dying, and she at once reminded me of the fact that she was not dead yet.

In an outdoor aviary, with plenty of breeding receptacles, this Parrakeet sometimes multiplies so rapidly that it becomes necessary to give the young away in order to get rid of them.

In the Ground Parrakeet (*Pezoporus*) the tail is longer than the wing, and the claws are long and straight; it runs with great speed on the ground, and is not known ever to perch on trees. Its food consists of seeds of grasses, etc., and in captivity I should imagine it would do well upon canary, millet, oats, and perhaps a little hemp, but neither Russ in his "Handbook," nor Seth-Smith in his "Parrakeets" says anything as to its food in captivity; however, as it is rapidly becoming extinct, the chances are that none of my readers will ever possess it.

Ground or Swamp Parrakeet (*Pezoperus terrestris*).

Above green, irregularly banded with black and yellow; flights internally brown, externally greenish, and with a yellow spot on each; four central tail-feathers green with numerous yellow transverse bars; lateral feathers yellow with numerous dark green bars; frontal band dark orange; feathers of crown and nape with a broad central black streak; a few black spots on the fore neck; under-surface greenish-yellow, crossed by numerous blackish bands; wings below dark grey, with a yellow band; under wing-coverts more or less tinged with blue along edge of wing; beak horn-coloured; feet bluish-flesh-coloured; irides black, with a fine pale grey ring. Female slightly smaller, her beak much smaller; plumage duller, the frontal band both duller and narrower. Hab., South and West Australia and Tasmania.

Gould observes ("Handbook," Vol. II., pp. 86, 87): "Having very frequently met with it in a state of nature, I am enabled to state that in its actions it differs from every other known species of its family. Whether the power of perching is entirely denied to it or not I am uncertain, but I never saw it fly into a tree, nor could I ever force it to take shelter on the branches. It usually frequents either sandy, sterile districts covered with tufts of rank grass and herbage or low swampy flats abounding with rushes and the other kinds of vegetation peculiar to such situations. From its very recluse habits and great powers of running, it is seldom or ever seen until it is flushed, and then only for a short time, as it soon pitches again and runs off to a place of seclusion. On the approach of danger it crouches on the earth or runs stealthily through the grasses, and, from the strong scent it emits, dogs road and point as dead to it as they do to ordinary game birds; consequently, when shooting over swampy land in Australia, the sportsman is never certain whether a Parrakeet, a Quail, or a Snipe will rise to the point of his dog. It flies with great rapidity, frequently making several zig-zag turns in the short distance of a hundred yards, which it seldom exceeds without again pitching on the ground. Its flesh is excellent, being delicate in flavour, and equalling, if not surpassing, that of the Quail and Snipe. Its five or six white eggs are deposited on the bare ground."*

* Campbell says that although Gould obtained young birds, he did not secure eggs, which no doubt accounts for his overestimating the number of eggs to a clutch.

According to Mr. A. J. Campbell ("Nests and Eggs," p. 658), the nest is a "somewhat deep hollow in the ground, evenly lined with fine grass, etc., under a tussock of grass—usually a button-grass tussock in Tasmania. A nest in the Australian Museum is composed of rushes and wire-grass, bitten into suitable lengths, bent and roughly interwoven into a platform about 4½ in. in diameter, and about ½ in. thick. *Eggs:* Clutch, three to four, round in form; texture of shell fine, surface glossy; colour, white; dimensions in inches of a clutch (1) 1.11 × .8, (2) 1.1 × .87, (3) 1.09 × .9."

The London Zoological Society purchased an example of this bird in May, 1865, but I do not know of any private bird-lover who has possessed it in this country.

Night Parrakeet (*Geopsittacus occidentalis**).

Above olive-green; upper back black spotted with yellow; lower back, upper wing-coverts, upper tail-coverts, and breast, with the feathers spotted with black and irregularly banded with yellow; primary coverts and flights greyish brown; tail blackish, banded with yellow; feathers of crown and hind neck, black in the middle; cheeks and sides of neck with small black spots; abdomen and under tail-coverts sulphur-yellow, the former irregularly banded with black at the sides, the latter just perceptibly spotted with black; primaries below banded with yellow; beak horn-coloured; feet flesh-coloured. Female not differentiated, probably with a weaker beak than the male. Hab., South-western and South Australia.

A. J. Campbell says ("Nests and Eggs," p. 660): "The Night Parrakeet ranges across Southern Australia, living chiefly in the porcupine or spinifex grass of dry and arid tracts. The bird has been observed in the Wimmera district, Victoria, where it was reported a nest containing five eggs was found in some porcupine grass."

"The following interesting 'Notes on the Night Parrot' were read by the late Mr. F. W. Andrews before the Royal Society of South Australia, Feb. 6, 1893: 'During the day this bird lies concealed in the inside of a tussock or bunch of porcupine grass (*Triodia*), the inside being pulled out and a snug retreat formed for its protection. Here, also, its rough nest is formed, and four white eggs laid. When the dark shades of evening have fairly set in, it comes out to feed, but generally flies direct to the nearest water, which is often a considerable distance from its nest; in some instances I have known them fly a distance of four or five miles. After drinking and shaking themselves up a little, they fly off to feed on the seeds of the porcupine grass, returning to water two or three times during the night.

"'The name given to this bird by the aborigines is "Myrrlumbing," from the supposed resemblance of their whistling note to the sound of that word. They have also a peculiar croaking note of alarm whilst at the water, which much resembles the loud croak of a frog. On one occasion one of these Parrots was caught in a hut, where it had apparently been attracted by the light of a bush lamp; it was put into a box, with a handful of dry grass. On examination the next morning the bird could not be seen; it had placed the dry grass in a heap and had drawn out the inside straw by straw until it had formed a hole, in which it had concealed itself.'"

An example of this Parrakeet was presented to the Zoological Society of London in 1857, and a second was purchased in 1873.

* In Geopsittacus the tail is shorter than the wing, and the claws are short and curved. In its wild state it feeds chiefly on the seed of the Porcupine-grass.

Family Stringopidæ (Night Parrots).

This family is represented by one genus, containing two species; they are very Owl-like Parrots in outline, though not in colour; the beak is thick and swollen at the sides, without notch to the upper mandible; the nostrils open in a much swollen cere. The wings are short and rounded, as also is the tail, the feathers of which are somewhat pointed; the tarsus is rather long; the feathers soft, those round the eye arranged in a circle as in the Owls. In their wild state they feed upon grass, weeds, vegetables, fruits, nuts, seeds, and roots. They nest in holes under trees or rocks.

Night Parrot or Kakapo (*Stringops habroptilus*).

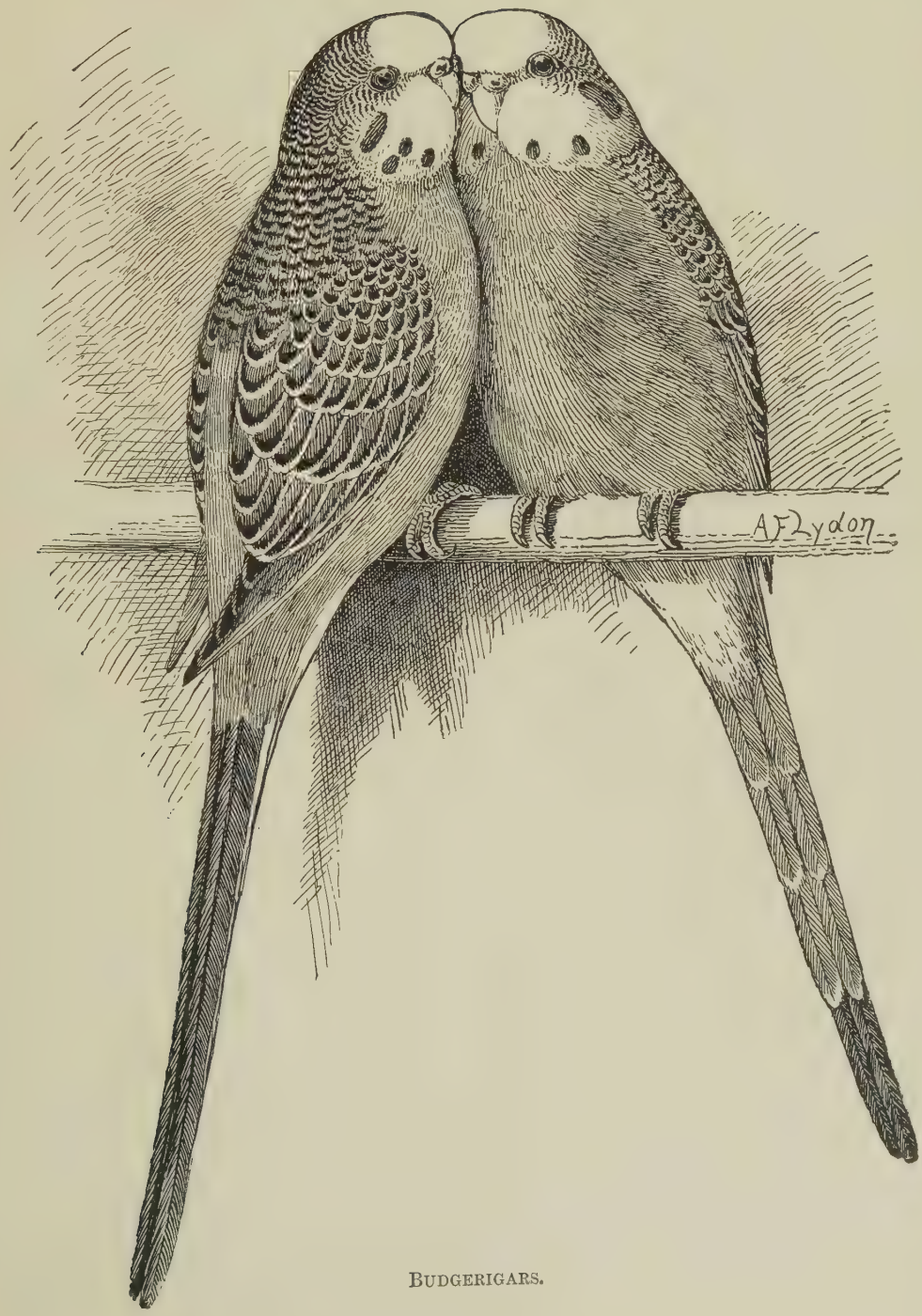
Above sap-green, tinged with verdigris on the greater wing-coverts; each feather with a yellow central marking, bounded on each side by a black band, which emits transverse irregular bands of the same colour; outer webs of greater wing-coverts, flights, and tail brownish-buff, crossed by irregular black bands, between each alternate pair the interval is lemon-yellow; inner webs of flights black more or less banded with lemon-yellow; feathers of crown brownish-black, edged with sap-green and greenish in the middle; forehead, cheeks, ear-coverts, and projecting feathers of the face pale umber, with yellowish-white centres; under surface pale greenish-yellow, washed with lemon-yellow, and more or less banded with pale yellow and black; beak yellowish-white; feet yellowish-brown; irides black. Female apparently smaller, duller, and with less heavily constructed beak. Hab., New Zealand.

Dr. Lyall, R.N., published an account of the habits of this species in the "Proceedings of the Zoological Society of London" for 1852, which is quoted in full by Gould, as follows: "Although the *Kakapo* is said to be still found occasionally on some parts of the high mountains in the interior of the north island of New Zealand, the only place where we met with it, during our circumnavigation and exploration of the coasts of the islands in H.M.S. 'Acheron,' was at the south-west end of the middle island. There, in the deep sounds which intersect that part of the island, it is still found in considerable numbers, inhabiting the dry spurs of hills or flats near the banks of rivers, where the trees are high, and the forest comparatively free from fern or underwood.

"The first place where it was obtained was on a hill nearly 4,000 feet above the level of the sea. It was also found living in communities on flats near the mouths of rivers close to the sea. In these places its tracks resembled footpaths made by man, and led us at first to imagine that there must be natives in the neighbourhood. These tracks were about a foot wide, regularly pressed down to the edges, which are two or three inches deep amongst the moss, and cross each other usually at right angles.

"The *Kakapo* lives in holes under the roots of trees, and is also occasionally found under shelving rocks. The roots of many New Zealand trees growing partly above ground, holes are common under them. There were frequently two openings to these holes, and occasionally, though rarely, the trees over them were hollow for some distance up.

"The only occasion on which the Kakapo was seen to fly was when it got up one of these hollow trees, and was driven to an exit higher up. The flight was very short, the wings being scarcely moved; and the bird alighted on a tree at a lower level from the place



BUDGERIGARS.

from whence it had come, but soon got higher up by climbing, using its tail to assist it.

"Except when driven from its holes, the *Kakapo* is never seen during the day, and it was only by the assistance of dogs that we were enabled to find it."

"During the latter half of February, and the first half of March, whilst we were amongst the haunts of these birds, we found young ones in many of the holes, frequently only one, never more than two in the same hole. In one case, where there were two young ones, I found also an addled egg. There was usually, but not always, an old bird in the same hole with the young ones.

"They build no nest, but simply scrape a slight hollow amongst the dry dust formed by decayed wood. The young were of different ages, some being nearly fully fledged, and others covered only with down. The egg is white, and about the size of a pigeon's, 2⅛ in. long by 1 9-16 in. broad.

The cry of the *Kakapo* is a hoarse croak, varied occasionally by a discordant shriek when irritated or hungry. The Maories say that during winter they assemble together in large numbers in caves, and, at the times of meeting, and again before dispersing to their summer haunts, that the noise they make is perfectly deafening."

Dr. Lyall then gives some account of specimens which he kept as pets; they were subject to sullen fits and used to bite severely. On the other hand, Sir George Grey gives them a good character, as lively, animated, playful, etc. When pleased with its food it makes a grunting noise.

Between 1870 and 1875 no less than six examples of this Parrot were exhibited at Regent's Park, and in May, 1907, a specimen was deposited there.

CHAPTER XV.

ORDER COLUMBÆ

(Doves or Pigeons).

Jerdon observes that the "Pigeons may be said to be intermediate to *Rasores* and *Insessores;* and Cuvier considered that they form the passage from one tribe to the other. Some ornithologists place them as an aberrant family of the *Rasores;* others as the last of the *Insessores.* They approximate the *Rasores* by their vaulted beak, their large nasal fossæ, covered by a soft membrane; their crop dilatable externally, the form of their tarsus and foot, and their blunt nails, their massive form, and general physiognomy, and by their affording excellent food; whilst they hold to the *Insessores* by their monogamous habits, the young being hatched blind and helpless, the hind toe being on a level with the other three, and the short tarsus never being spurred. In their internal anatomy, too, they equally partake of both, having the thick gizzard of the *Rasores,* and the small cœca and simple gastric glands of the *Insessores.* On the whole, I consider, with Wallace and others, that they approach the *Rasores* more nearly than they do the *Insessores.*"

The Doves, as a general rule, form a platform of twigs in a tree as a nest, upon which they lay two white eggs. Some species, however, build and lay in caves, and others merely scratch a hollow in the earth and line it sparsely with dead grass or other herbage; some species also only lay one egg.* In a general way the *Columbæ* are vegetable feeders, living upon fruit, young shoots of various plants, or seeds, but they also greedily devour earthworms; and I suspect that the soft larvæ of certain insects are not despised by them; they eat them greedily in captivity.

Fruit Pigeons (*Treronidæ*).

I do not think it worth while to consider the three sub-families into which Salvadori has divided this family, chiefly upon the relative length and width of the bill. This is an excellent feature for the differentiation of the sexes; but I should think that in the case of a multitude of species it would be less valuable, the differences being more defined in one species than another, so that one would sometimes have to rely upon colouring to decide as to which sub-family a bird belonged to. Perhaps I am wrong; but I note that colouring enters into the diagnoses, and it is not a safe character to rely upon even for genera, much less for sub-families.

The fruit pigeons, with a few exceptions, have fourteen tail feathers; the soles of their feet are very broad, each toe having the skin expanded at the sides. They are, for the most part, beautifully coloured birds, but common, and easily obtainable, as they should be, from the natives of the Papuan and South Pacific Islands, are hardly ever to be seen alive here; or, if perchance one sickly bird does reach the London dealers, its price is so high as to be prohibitive.

I supposed at one time that fruit pigeons might be difficult to feed during the journey home; but, on the contrary, I understand that they will readily accept moistened peameal or boiled potato, in the absence of fruit; and I cannot see why preserved fruits should not be soaked in warm water and supplied as a change of diet. It is a grievous thing that the lovely species of *Ptilopus* should so rarely be seen in captivity.

In confinement, according to Russ, these birds may be fed upon a soft food mixture, boiled carrot, potato, figs, moistened white bread, boiled rice, as well as minced raw meat and hard-boiled dried egg. I should be inclined to omit the raw meat and substitute a few small earthworms or mealworms.

Wedge-tailed Fruit Pigeon (*Sphenocercus sphenurus*).

Upper surface olive-green; the back washed with maroon; lesser upper wing-coverts maroon; median and greater-coverts olive-green, the latter narrowly edged with yellow; flights mostly slate-black, narrowly edged with yellow; but the tertiaries olive-green; tail of the latter colour, but increasingly tinged with grey, and with an ill-defined subterminal blackish band; head, neck, and under surface mostly greenish-yellow, but the crown and breast suffused with rufous; sides grey, with green edges to the feathers; flanks dark green, with yellowish-white borders to the feathers; centre of abdomen yellowish-white; longer under tail-coverts buff or pale ashy, the basal ones green towards base, yellowish-white towards tips; wing beiow leaden-grey; tail below grey; bill dull smalt-blue, very pale blue towards tip; feet crimson-pink; orbital skin pale smalt-blue; irides with an inner ring of pale bright-blue, and an outer ring of buffy-pink. Female of a darker green, with no maroon on the back and wings, which are uniform with the rest of the upper surface; crown and breast not suffused with rufous; the longer under

* It has been stated that the *Columbæ* never lay more than two eggs, but I have seen three well-grown young in the nest of the European Wood-Pigeon; of course, two females may have deposited in the same nest.

tail-coverts yellowish-white, centred with ashy olive-green. Hab., "Kaschmir, along the Himalayas and Burmese countries as far south as Mooleyit in Tenasserim." (Salvadori).

Jerdon says ("Birds of India," Vol. III., p. 453): "They frequent high trees, and feed, of course, exclusively on fruit. Hutten found them breeding in May and June, making the usual nest of dried twigs, and with two white eggs.

"The male has a most agreeable note, more prolonged and musical than that of Crocopus. Blyth says of it: 'The notes bear some resemblance to the human voice in singing, and are highly musical in tone, being considerably prolonged and modulated, but always terminating abruptly, and every time the stave is repeated exactly as before, so that it soon becomes wearisome to a European ear.' After moulting in confinement the green colour, in some specimens, becomes replaced by a delicate pearl-grey, and the russet tinge of the head and breast becomes pale marone."

Russ states that in captivity in Europe this species has only appeared at the London Zoological Gardens, an example having been presented in 1867 and a second ten years later.

Waalia Fruit-Pigeon (*Vinago waalia*).

Upper surface mostly olive; lesser and median wing-coverts, excepting the innermost ones, rich vinous; wings otherwise blackish-brown, the outer median and greater coverts and the secondaries with yellow borders to the outer webs, the primaries with narrow yellowish edges; central tail-feathers leaden-grey, the other feathers with a terminal leaden-grey belt; head, neck, and front of breast greyish-olive; back of breast bright yellow; sides olive-greyish; abdomen whitish-buff; thighs buff, more or less yellowish; under tail-coverts with broad whitish-buff borders, the centres of the smaller ones dark olivaceous-grey, of the longer ones chestnut; wings below and axillaries leaden-grey; under wing-coverts slightly greenish; tail below black with a broad terminal grey belt; bill bluish-grey with the base red; feet pinkish-yellow; irides blue, with an outer rim of salmon-pink ("whitish-yellow"—Antinori). Female smaller, and probably with a more slender bill. Hab., "North-East Africa, Somaliland, Socotra, and through the Equatorial region to Senegambia." (Salvadori.)

Heuglin says: "According to my notes the iris is either whitish with a bluish tinge, violet, or yellowish with a distinct sky-blue ring, or brownish-yellow with a similar ring, or, lastly, sky-blue encircled with brownish-yellow." He remarks respecting the wild life ("Ornithologie Nord-Ost Africa's," Vol. I., pp. 819, 820): "Brehm, like myself, considers this to be a resident bird, and according to him it assembles in small families in the deeper mountain valleys and the plains of Samhar (Abyssinian coastal region), lying immediately at the foot of the mountains, in which the beauty of the tropical region has become permanent. Lofty umbrageous acacias, which the Christ-thorn surrounds as a protection and the *Crisus* with its manifold tendrils interlaces, there form the chosen home of this pigeon, while in the mountain valleys the beautiful tamarinds, kigelias, with their dense foliage, and lastly the shady summits of the more mighty sycamores, still afford suitable residences. On the other hand, I never met with the Waalia upon acacias or kigelias.

"It is a tolerably skulking bird, which understands well how to conceal itself in the foliage and, as it were, to crouch against the grey-green branches of the fig trees, so that one rarely catches sight of it. If one approaches the favourite trees, one of the pigeons after another shoots noisily off in the opposite direction in order again to conceal itself in the crown of another tree. The Waalia betrays its presence to the hunter, however, from a great distance by its restless disposition, the flapping of its wings, and a peculiar twittering and whistling of the amorous males, lastly in that these birds are always busy feeding and throw a quantity of fruits on the ground. When flying away one notices a violent jerk or forward impulse, and then the vigorous flapping of the wings. The flight itself is quick as lightning and direct, in spite of the heavy body, but the necessary effort required for it seems soon to tire the pigeon. According to my hunter's assurance, the Waalia breeds in the hollow branches of the daro trees. I did not see it on the earth. We also never found cereals in the crop. At the time when figs are ripe its whole face is often plastered with the yellow pulp of these fruits, also the fat is of a deep yellow colour, while the dry flesh is hard and tasteless."

Two specimens of this pigeon reached the London Zoological Gardens in November, 1898.

Thick-billed Fruit-Pigeon (*Vinago crassirostris*).

Upper surface mostly dark olive; upper wing-coverts near bend of wing dark purple; greater coverts with a pale yellow band near tips; primary coverts and flights blackish, the latter edged with yellow; tail dark grey, central feathers edged with olivaceous towards the base, lateral ones black about the middle; head, neck, and breast dark olivaceous-grey; abdomen, flanks, and tibial feathers yellow; flank-feathers dark olive down the centre; under wing-coverts and flights below leaden-grey, the former edged with dark olive; tail below black, with a broad terminal grey belt; bill short and thick, grey at tip, dark red at base; feet yellow; irides bluish-white. Female smaller and of a deeper colour. Hab., "Islands of St. Thomas and Rollas, W. Africa." (Salvadori.)

I can discover no field notes relating to this species, nor does Dr. Russ seem to have noticed it, although it was represented in the London Zoological Society's collection as long ago as 1865, and was again received in 1884.

Bare-faced Fruit-Pigeon (*Vinago calva*).

Above mostly olive-green; a broad leaden-grey collar at base of hind neck; a vinous-purple patch near the bend of the wing; primary-coverts and flights black, the latter edged with yellow; greater wing-coverts and secondaries bordered with yellow; tail grey, the lateral feathers with a more or less distinct paler terminal belt; forehead naked, and apparently swollen into a large knob; head, neck, and underparts more or less yellowish olive-green; flanks olive, the feathers edged with yellowish-white; centre of abdomen pale yellow; tibial feathers bright yellow; under tail-coverts cinnamon, edged with pale buff, the smaller ones partly olive, edged with whitish; under wing-coverts greenish leaden-grey; flights below leaden-grey; tail below black, with a terminal grey belt; bill bluish-grey, red towards base; feet yellowish-flesh or orange-yellow; irides blue, surrounded by a red rim. Female smaller, with smaller vinous patch on the shoulder, and little or no grey on the nape. Hab., "Western Africa from Bissao to Angola, and through Equatorial Africa to East Africa, as far south as Zambesi." (Salvadori.)

Heuglin gives no account of the habits of this pigeon in his work, but Reichenow describes its call-note as a prolonged turr. Dr. S. L. Hinde (*The Ibis*, 1898, p. 586) says:—"Common wherever there are a few trees from Mombasa Island inland. This bird never

feeds on the ground, and I should think it doubtful whether it ever alights there."

Mr. Boyd Alexander observes (*The Ibis*, 1903, p. 395) :—" Iris blue; bill bluish horn-coloured, soft parts crimson; legs and feet orange-yellow.

"A common pigeon in the vicinity of cultivation."

Mr. G. L. Bates (*The Ibis*, 1907, p. 419) says : " The ' Obeñ ' is the most abundant pigeon in every place where I have been. It was often seen in the Zima country. It is found wherever there is ripe, wild fruit, but is most abundant in old clearings where the ' Umbrella-tree ' (' Asêñ ') grows. I have seen large flocks in the more open inhabited country, where the above-named tree grows abundantly, in the dry season (July); and I used also to see large flocks in the mangroves of the Lower Benito River at the same season. But usually the birds are seen, three or four or half a dozen together, among the leaves of the trees in which they feed; or, on a cool, misty morning, perched motionless on a high, bare limb. The call which they make at intervals while feeding is very unlike the cooing of a Dove. It consists of several varied syllables, suggesting words of human speech, and my Bulu boy can tell you what the Obeñ says.

" Specimens shot in July were breeding. A bird was seen sitting on its nest in September. This pigeon makes a rude nest in the forks of small trees, often near villages. It lays two white eggs."

Mr. A. L. Butler, writing on the birds of the Egyptian Soudan (*The Ibis*, 1908, p. 248), says :—" These Fruit-Pigeons were abundant between Meshra-el-Rek and Chak Chak, collected in flocks to feed on the fruit of a large *Ficus* locally known as the ' Gameiza.' They have a clear, modulated whistling note, like that of *Osmotreron*."

Mr. Douglas Carruthers describes the soft parts as follows (*The Ibis*, 1908, p. 316) :—" Iris blue; frontal knob and base of bill scarlet, tip pale grey; feet yellow, claws pale grey."

According to Mr. G. L. Bates (*The Ibis*, 1908, p. 562) this pigeon appears to breed all the year round in Southern Kamerun.

Between the years 1870 and 1872 the London Zoological Society received no less than nine examples of this Fruit-Pigeon, and Russ says that after 1870 it was imported fairly frequently, but does not mention its arrival at any of the Continental Gardens.

Delalande's Fruit-Pigeon (*Vinago delalandei*).

Upper surface mostly olive-yellow; a broad grey collar at back of hind neck; lesser wing-coverts vinaceous towards bend of wing; primary-coverts and flights black, the primaries edged, the secondaries and greater coverts bordered, with yellow; terminal third of tail pale whitish olive; head, neck, and under surface greyish-green; centre of abdomen and tibial feathers bright yellow; feathers of flanks olive along the centre, with broad, white borders; under tail-coverts chestnut, with broad, whitish borders, the basal ones olive with white borders; under wing-coverts and flights below leaden-grey; tail below black with a whitish-grey terminal belt; bill with the basal half crimson, the terminal half pale slate-colour; feet vermilion; irides pale blue, whitish towards the pupil. Female smaller; the head and neck more uniform, and of a deeper olive-green than in the male; the under tail-coverts olive, broadly bordered with whitish, and with very little cinnamon in the centre. Hab., " Eastern and Southern Africa, from Mombasa to Kaffraria, and inland as far as the Nyassa." (Salvadori.)

Stark and Sclater (" Birds of South Africa," Vol. IV., pp. 158, 159) describe the soft parts as follows :—" Iris pale blue to greyish or greenish-white; bill light bluish-horn; cere bright scarlet; tarsus and feet bright orange to vermilion." They thus describe the habits :—" This Green Pigeon seems to be a partial migrant, making its appearance suddenly when the wild berries and fruits of certain trees, especially figs, on which it chiefly feeds, are ripening. It is usually seen in small flocks, though occasionally found solitary. Owing to the colour of its plumage, and to its habit of frequenting tall and thickly-leaved trees, it is difficult to observe; moreover, it sits very close, only dashing out with rapid flight at the last moment. The Woodwards, however, found it very easy to shoot when feeding, and state that it is usually fat, and very delicate eating. The note is a somewhat musical whistle, and is quite different to the cooing of other pigeons.

" Ayres found a nest of this species in the Magaliesbergen of the Transvaal towards the end of November, 1882; it was composed of the usual layer of sticks, and was not more than ten feet from the ground; it contained a well-fledged young bird and an addled white egg."

Mr. J. L. Sowerby, describing birds from Mashonaland (*The Ibis*, 1898, p. 575), says : " This pigeon appeared suddenly in rather large flocks to feed on the fruit of certain trees. It has a note quite unlike an ordinary pigeon's, being more of a whistle than a ' coo.' "

Mr. Guy A. K. Marshall also remarks (*The Ibis*, 1900, p. 261) : " This handsome bird is common and generally distributed, though subject to partial migrations depending on the ripening of the various fruits on which it feeds. It is especially fond of the wild fig, the dense foliage of which affords it excellent protection, rendering it very hard to detect, as it sits very close, but it dashes out with considerable speed when roused. Its flesh is excellent."

It appears from a note in *The Ibis* for 1901, p. 176, that in British Central Africa the bill of this bird is " white," and its native name there is " *Nyandi*."

A note in *The Ibis* for 1904, p. 200, by Mr. G. C. Shortridge, merely repeats the observations already recorded by other collectors.

Mr. C. F. M. Swynnerton, writing on the " Birds of Gazaland " (*The Ibis*, 1907, pp. 305, 306), gives the following interesting account of the habits : " Extremely common throughout the district, and usually to be found feeding in flocks wherever wild figs or other ripe fruits are to be had, while frequently visiting the forest-patches for food, though in this case it seldom descends below the upper branches of the trees. It is evidently double-brooded, as I have had young brought to me in October and again have found a nest with eggs—the usual frail structure of sticks, about 10 feet from the ground—in Chirinda (somewhat to my surprise) in January; the large wild fig-trees which are scattered through the more open country are favourite nesting-sites. They are stolid birds, those in my aviary, even when freshly caught, allowing me to approach quite close before moving, and merely staring stupidly though quite evidently in fear. The call is a piping ' *kureti, kureti, kureti,*' followed by a harsh ' *kurrrr.*' The natives say that one individual out of a flock will sometimes purposely give a false alarm, returning immediately and enjoying the feast alone."

Miss Alderson (*The Avicultural Magazine*, Second

Series, Vol. I., pp. 232, 233) describes an example of this species in the possession of a friend which was fed upon boiled maize; it did not long survive. An example was presented to the London Zoological Society in 1892.

Purple-shouldered Fruit-Pigeon (*Crocopus phœnicopterus*).

The adult male has the crown of the head and the ear-coverts ash grey; the forehead, lores, and throat greenish; the neck and breast yellowish green; front of the mantle occupied by a half-collar of ash grey; remainder of back, including the scapularies, innermost lesser wing coverts, and tertiaries olive green; upper tail-coverts washed with grey; wing-coverts near bend of wing lilac; greater coverts bordered with pale yellow, forming an oblique bar across the wing; flights blackish with narrow pale yellow edges; tail above grey, yellowish olivaceous at the base; chest, abdomen, flanks, and axillaries pale grey; wings, below leaden grey; the coverts with slightly greenish edges; tail below black with a broad terminal grey belt; bill whitish; feet deep yellow; iris crimson with an outer circle of smalt blue.

The female differs in having hardly a trace of lilac on the bend of the wing, and the under tail coverts slate grey in the middle, more or less varied with chestnut. Hab., Eastern portion of the Punjab and Rajpootana, through the North-Western and Central Provinces to Bengal and the Eastern Himalayas.

According to Jerdon ("Birds of India," Vol. III., p. 448), Tickell "states that it breeds in the thick damp forests to the southward, towards Sumbulpore, during the rains. Many breed in various parts of Lower Bengal; and, as Blyth remarks, in the hot weather, not during the rains."

Hume ("Nests and Eggs of Indian Birds," pp. 371, 372) says that this species breeds from March to June. He adds: "I have only myself found two of its nests, both in the Etawah district (where I have taken at least a dozen of those of *C. chlorigaster*), both placed near the outside of large mango-trees, at heights of from 20 to 30 feet from the ground, and in the vicinity of water.

"The nests were slight twig-structures, laid upon two or three thin branchlets, forming a horizontal fork, devoid of lining, and perhaps 6 inches in diameter and 1 inch in thickness, with a shallow central depression barely ½ inch in depth. Two is, I believe, the full complement of the eggs.

"The eggs are of the usual Pigeon type, white and glossy, as a rule broad, nearly perfect, ovals, but occasionally in this and other species of Green Pigeons a good deal pointed at one end.

"In length they vary from 1.16 to 1.35, and in breadth from 0.9 to 1.0; but the average of eighteen eggs is 1.23 by 0.95."

According to Ram Bramha Sánáyl, the superintendent of the Zoological Garden at Calcutta, this bird does not appear to bear captivity well. It is a strange fact, but it is an undoubted one, that many species of tropical origin do not bear captivity in a tropical country (though it be their native one) so well as they do in our inclement land; either the soaked or parched gram which they constantly get is not sufficiently nourishing, or they need plenty of exercise to enable them to bear the overpowering heat of the climate.

An example of this species was deposited at the London Zoological Gardens in 1864, and a second specimen was presented the same year. In 1893 it arrived at the Berlin Gardens.

Southern Fruit-Pigeon (*Crocopus chlorogaster*).

Differs from the preceding species in its almost wholly grey crown, very slightly tinged with greenish on the forehead; tail above grey, with scarcely a trace of yellowish-green at the base, or none at all; the under surface pale yellowish-green. Female differing from the male in the ill-defined purple tinge near the bend of the wing, and the under tail-coverts grey in the middle, more or less mixed with chestnut. Hab., India, as far north as Nepal, and Ceylon.

Colonel Legge ("Birds of Ceylon," Vol. II., pp. 723, 724) observes that he was never fortunate enough to meet with this Pigeon. He adds: "As regards this fine Pigeon's habits in Ceylon I know nothing but that it is said by Layard to be very fond of the fruit of the banyan. Jerdon states that 'it comes in large parties, generally about 9 a.m., to certain spots on river-banks to drink, and, after taking a draught of water, occasionally walks a few steps to the damp sand, appearing to pick up small pebbles, pieces of gravel or sand.' Their call, he says, 'is very similar to that of the Bengal Green Pigeon"; but this he does not describe. Like all its family, it is entirely frugivorous in diet. Captain Butler states that the berries of the *Ficus indica* appear to be its favourite food.

"*Nidification.*—This Green Pigeon breeds throughout Continental India from March till June, making, according to Mr. Hume, a typical Dove's nest, and laying two white eggs. Mr. Blewitt, writing concerning nests he found near Hansie, says that they 'were placed on various trees, mostly growing on the canal-bank, at heights of from 14 to 18 feet from the ground. They were composed of Shishum, *Zizyphus*, and Keeker twigs, in some cases slenderly and in others somewhat densely put together. One or two were absolutely without lining; but they were mostly very scantily lined with leaves, feathers, or fine straw.' This is remarkable for a Pigeon's nest, as they usually have no lining at all, and other observers testify to there being none in the case of this species. The birds sit very close, Messrs. Hume and Marshall both stating, with regard to nests found by them at different times, that they pelted the bird without her flying away. The eggs average in size '1.25 by 0.95 inch.'" A specimen of this species was deposited at the London Zoological Gardens in 1895.

Nepal Thick-billed Fruit-Pigeon (*Treron nipalensis*).

Neck, rump, and upper tail-coverts olive-green; mantle and lesser upper wing-coverts chestnut; wings otherwise black; the median and greater coverts and secondaries with yellow edges; middle tail-feathers olive-green, other feathers grey crossed by a median black belt; crown ashy, paler on the forehead; breast and abdomen olive-green, the former faintly tinged with fulvous; sides leaden-grey; flanks green mixed with white; under tail-coverts cinnamon; bill pale yellowish or greenish-white tipped with greenish, the gape and base of upper mandible to nostrils bright red; feet lake—to coral-red; orbital skin pea-green; irides varying from bright orange to yellowish-red. Female with olive-green in place of the chestnut on the plumage above, and the under tail-coverts white or buffish-white, irregularly barred with green. Hab., "Eastern Bengal and South-Eastern Himalayas, extends down the Malay Peninsula to Sumatra, Borneo, and the Philippines; it occurs also in Siam and Cochin-China." (Salvadori.)

Jerdon does not describe the habits of this species, but merely comments upon its extremely strong bill.

The late Colonel Charles T. Bingham found nests in Tenasserim, respecting which I quote from Hume's

"Nests and Eggs of Indian Birds," Vol. II., p. 370, as follows:—"I found several nests of this bird, which breeds in the Thoungyeen forests, throughout the end of February and the whole of March. My first four nests were all found in one day, and all were little platforms of straw on horizontally-growing bamboos, containing each a couple of unfledged young. This was on the 3rd March. Again on the 22nd March I got a nest similarly placed, with two eggs so hard-set that I failed to save them.

"The only other egg I got was on the 28th March, near Yok village, in the Meplay district. It was placed in the usual flimsy nest in the fork of a small tree about 10 feet above the ground, and was pure white in colour and perfectly fresh. I procured the female to make certain." According to Hume this egg measures "1.13 by 0.89."

Russ states that in 1894 G. Bosz, of Cologne, imported this species for the first time, and forwarded it to him for identification.

Double-banded Fruit-Pigeon (*Osmotreron bicincta*).

"Male, above green, brighter and more yellow on the forehead, with the usual yellow wing band; occipital region and nape ash grey; tail grey, with a blackish medial band on all but its middle feathers; beneath green, yellowish on the throat, and with a large buff-orange patch on the breast, surmounted by a narrow lilac band somewhat broader on the sides; vent pale yellow; under tail-coverts cinnamon coloured, and the lower surface of the tail blackish, tipped with greyish white."

"The female differs in wanting the blue and orange breast, in the whole lower surface being brighter green, and in the lower tail-coverts being mingled reddish ashy and buffy white; bill greenish glaucous; legs pinkish-red; irides red, surrounded by a blue circle." (Jerdon.) Hab., "Sub-Himalayan region, Eastern Central Provinces of India and Burmese countries, as far east as Cochin-China and Hainan, and also the Malay Peninsula, with the island of Salanga and Ceylon." (Salvadori.)

In India this bird is generally seen in flocks of fifty, sixty, or more individuals. It flies very rapidly; its note is very melodious. The young are often brought into the Calcutta market about June.

Ceylonese birds are slightly smaller than those of India. They frequent low jungle, the outskirts of the forest, detached rows of trees in the open, or almost anywhere where their favourite food may be found. The Ceylon birds, excepting when feeding, are seen mostly in small companies. The favourite food of the species consists of berries of the bo, banyan, palu, and poppalille trees; its times for drinking are at seven in the morning and four in the afternoon.

Nidification commences in May or June, but sometimes continues until August; the nest is formed of twigs, and lined with roots: it is placed either in a fork or near the end of a branch, and contains two glossy white eggs.

A female of this species was deposited at the London Zoological Gardens in 1864, and the same year a second example was presented; in 1895 Mr. Frank Finn also gave a specimen to the Society.

Parrot Fruit-Pigeon (*Osmotreron vernans*).

Green; neck all round vinaceous purple; mantle, back, lesser and median upper wing-coverts dull grass-green; upper tail-coverts with a rufescent tinge; greater coverts and flights black, the former and the tertiaries with pale yellow borders; tail dark slate-grey with a broad sub-terminal black belt, ill-defined on the central feathers; head, chin, and throat grey; the forehead, sides of head and throat faintly tinged with greenish; a deep orange patch on the breast; abdomen yellowish-green; sides and under surface of wing pale slate-grey; flanks and vent pale yellow, varied with grey; tibial plumes pale yellow; under tail-coverts chestnut; tail below black, narrowly tipped with grey; bill pale leaden grey, cere dirty yellow; feet carnation-pink or pale lake-red; irides with an outer ring of rose-pink, a central ring of Prussian blue, and an inner ring of ultramarine. Female with the head, neck, and breast green, forehead, sides of head, throat and breast tinged with dull yellowish; under tail-coverts buffish-white, more or less suffused with pale dull cinnamon, the latter often mottled with dark grey or greenish-grey; the grey on the head, the vinous purple on the neck, and the orange on the breast are all wanting. Hab., "Siam and Cochin-China, South of Tenasserim, Malay Peninsula, Sumatra, Nias, Bangka, Billiton, Java, Sumbawa, Borneo, the Philippines, Sulu Islands, and Celebes." (Salvadori.)

The following notes on the nidification of this species occur in Hume's "Nests and Eggs of Indian Birds," Second Edition, Vol. II., p. 375:—"Mr. Davison, writing from Southern Tenasserim, says:—'On the 12th of January (1880) I found a nest of this Pigeon in a small, very dense thorny bush. The nest was of the usual pigeon and dove type, consisting merely of a few dry twigs. It was placed about 5 feet from the ground.'"

"These eggs measure 1.15 in length by 0.81 and 0.82 respectively in breadth.

"Two other eggs found at Kussoom, in the Malay Peninsula, on the 7th July measure 1.11 and 1.05 in length, by 0.86 and 0.85 respectively in breadth.

"The eggs are ovals, varying from moderately broad to considerably elongated ones, always apparently obtuse at one end, often at both. They are pure white and have little gloss."

Russ observes that Kelham observed them very numerously in Malacca, but especially on the well-wooded islands of the peninsula. Every evening before sundown they flew, always in the same direction, in about five or ten individuals, occasionally in great flocks, in order to spend the night in a favourite group of trees. If, however, they were much shot at, after a few evenings they altered their route. Their flight is swift. The same gentleman found them breeding in Perak among bushes in marshy valleys. They construct a small flat nest loosely formed of dry twigs at about 2 to 3 feet from the ground. The clutches consisted of two eggs of a delicate cinnamon-red colour, white when blown.

According to Blaauw, this species is not only spiteful towards its own kind, but even will not permit its wife to approach it; the male of a true pair injured its female so severely that it was impossible to keep them together in a large flight. He tried various experiments, but could not get two to agree, and consequently failed to breed with them. He says that the voice is the most noticeable thing about this Pigeon. It commences with a sharp, long-drawn *kräh kräh*, frequently repeated, then follows a kind of barking and mewing, and *kräh kräh* terminates the exercise. At the time the tail is moved up and down, the bill is widely opened, and the head jerked forwards and backwards.

A pair of this species reached the London Zoological Gardens in 1876, the Amsterdam Gardens acquired the species in 1882, G. Reisz exhibited a pair at the

"Ornis" Exhibition in 1893, and priced them at 25 marks, and of late years others have appeared from time to time in the bird-market.

We now come to the most brilliantly-coloured of the Fruit-Pigeons, birds which it would be a delight to see in our aviaries, but which are incomprehensibly rare in the bird-market, namely, the species of the large genus *Ptilopus*.

The British Museum Catalogue describes no less than seventy-five different forms of this most attractive group. Mr. D. G. Elliot, speaking of their geographical distribution, says: "The members of the genus *Ptilopus* are found in only two of the zoogeographical regions of the earth, viz., the Oriental and Australian. Of these the latter contains by far the great majority of the species, and . . . the Papuan group of the Austro-Malayan sub-region is apparently the head-quarters of the genus. The Polynesian sub-region also possesses many species; but they are altogether of a different style of plumage, and constitute almost a division by themselves.

Of the seventy-five known species only seven appear to have been imported alive into Europe, although many thousands of specimens have been wantonly slaughtered in order to decorate ladies' bonnets; indeed, Mr. Elliot states that he saw one box three feet square containing hundreds of examples of one species, which were destined to be torn to pieces to supply the demands of this disgraceful fashion.*

Jamboo Fruit-Pigeon (*Ptilopus jambu*).

The adult male has the head to the middle of the crown, behind the eyes, across the ear-coverts to the throat, deep crimson; the back of head, nape, and upper parts generally bronze-green; the primaries are black, with dark blue-green outer webs; their tips and secondaries narrowly edged externally with buffish white; tail above green, but with somewhat buffish terminal band; the back of ear-coverts, sides, and front of neck pure white, tinted with buff on the sides of the breast and all over the abdomen; a chestnut stripe passes down the chin and middle of throat; the middle of the breast is flushed with pink; the flanks, axillaries, and thighs are greyish-green; the under tail-coverts deep cinnamon; wings below leaden grey, excepting the under-coverts, which are green; tail below blackish-grey, with pale terminal band; bill bright yellow; feet deep red; iris red.

The female has the facial mask of a duller crimson, the stripe down the throat deep cinnamon; the breast greyish-green, changing behind to greyish-white; the under tail-coverts paler than in the male. The young are most like the female, but show no crimson on the head and have buffish-white under tail-coverts. Hab., Malay Peninsula, Sumatra, Bangka, Billiton, and Borneo.

Mr. C. Hose says (*The Ibis*, 1893, p. 422) that this is a "low-country species, but found on Mount Dulit at 5,000 ft."

Mr. Frank Finn (*The Ibis*, 1901, p. 443) observes that Mr. Rutledge, of Calcutta, has on a few occasions procured the lovely *Ptilopus jambu*, and he adds: "Fruit-Pigeons are quite easy to keep, as they live well on any *soft* vegetable food, such as *satoo* paste or boiled rice, and I wonder that the home dealers do not take more trouble to introduce these most exquisitely coloured birds."

Mr. L. Wray, jun., states (cf. "Proceedings of the Zoological Society," 1887, p. 432) that this species is very rare in Perak. He describes the soft parts as follows: "Irides white, bill yellow, feet and legs red."

As this is the unfortunate bird referred to by Mr. Elliot as one of the subjects chosen for wholesale slaughter, as, moreover, it is common at Banjermassing, in Borneo, and probably in other parts of the Malay Archipelago, which it inhabits, there ought to be no difficulty in securing living examples. In its wild state it subsists chiefly upon various species of figs.

This species first reached the London Zoological Gardens in 1870; a pair was added in 1874 and a fourth example in 1875; it reached the Amsterdam Gardens in 1874.

Banded Fruit-Pigeon (*Ptilopus fasciatus*).

Back, rump, and upper tail-coverts bronzy green; wings shining green, with yellow edges to the flights; inner secondaries with lilac spots towards the tips; tail above green, with a broad yellow terminal belt; forehead and crown magenta, faintly edged behind with yellow; back of head, neck, and breast greyish-green; throat yellowish-white; a dark purple band between the breast and abdomen; the latter rufescent in the centre; hinder abdomen and vent yellow; under tail-coverts yellow, tinged with orange, or even slightly rosy; tail below dark grey, with a pale grey terminal belt tinged with yellow; bill greenish-grey; feet purple; irides yellowish-buff. Female smaller, with no yellow edging to the magenta on the crown; the back of neck and mantle greyish-green, paler than the back; underparts altogether greener. Hab., Samoan Islands.

The Rev. S. J. Whitmee ("Proceedings of the Zoological Society," 1873, p. 153) says: "The *Ptilopus fasciatus* is a favourite bird with the natives of these islands, and is kept very generally by them. Its native name is *Manu-tagi* (the crying bird). The Samoans train it to act as a decoy, and take it into the woods in a wicker cage open at the top. When it calls, other birds come to it and enter the cage, when they are taken by the native, who lies hidden near the spot. The birds thus taken are eaten by the natives. But this custom of decoying is going out now in consequence of the ease with which the birds may be shot."

Mr. M. J. Nicoll (*The Ibis*, 1904, p. 61) says: "This beautiful little Pigeon is not uncommon in Upolu at an altitude of about 1,000ft., but is very shy. It feeds on the fruit of a tall tree; this fruit is about the size of a large olive, and is swallowed entire."

In his "Three Voyages of a Naturalist," p. 236, the same writer observes: "The most numerous and probably the most beautifully coloured of all the birds in Samoa is a small Dove, of about the size of a Turtle-Dove, with an emerald green back, a ruby red crown, and a brilliantly-coloured breast of several shades of red and yellow."

Russ observes that at the Exhibition of the "Ornis" Society of Berlin in 1881 Miss Virginia Wohlgemuth, of Charlottenburg, near Berlin, sent this lovely Pigeon, which is prized here on account of its beauty and rarity. The brother of the lady, who was an officer of the German marine, had brought it from the Samoan Islands. Otherwise it has only once arrived alive in Europe, one example in 1862 at the Zoological Gardens of London."

"In 1883 Miss Wohlgemuth made me a present of the pigeon, and it survived for two years longer in my bird-room. It was evidently of a good age when I received it. It sat motionless there, or fed upon the food

* I believe an eighth species has been imported since this account went to press.

mentioned at p. 840.* Rarely, usually in the evening, it uttered its strange, four-syllabled cry—Kikikuhitt."

This is one of the instances of a lovely dove, kept by the natives of all the Samoan Islands, easily decoyed, and not difficult to keep, which has only twice been imported.

Purple-crowned Fruit Pigeon (*Ptilopus porphyraceus*).

Back, rump, and upper tail-coverts bronze-green; wings shining green with yellow edges to the flights; inner secondaries spotted with lilac towards the tips; tail above green with a greyish-white subterminal band tinged with green and yellowish at the edges; forehead and crown magenta, with an ill-defined yellow edge at the back; back of head, neck, and breast greyish-green; throat yellowish-white; a dark green patch, sometimes tinged with deep purple between the breast and abdomen; abdomen and flanks green; vent and under tail-coverts yellow or orange-yellow; tail below dark grey, with a broad terminal pale grey belt; bill greenish-grey; feet magenta; irides yellow. Female altogether much greener than the male; the dark green patch in front of abdomen sometimes, if not always, without purple tinge. Hab., "Tonga Islands—Tongatabu, Ena, Lifuka, Hapai, Vavao, Ninafou, Futuna Island; Savage Island and Fiji Islands—Balaou, Wakaia, Mokani, Loma-loma, Mango, and Taviuni." (Salvadori.)

E. L. Layard ("Proceedings of the Zoological Society," 1876, pp. 502, 503) says: "This 'green dove' is not uncommon, and is decidedly intermediate between our *P. fasciatus* and the Samoan *P. apicalis*." "In habits it resembles its brethren, and is called by the natives 'Kullu Kullu.'" Dr. Hans. Gadow, writing on the birds of the Island of Rotumah (*The Ibis*, 1898, p. 44), says: "Called 'Ku-ku' from its note, *cu-cu-cu*, etc."

At Nine or Savage Island the native name of the bird is stated (*The Ibis*, 1905, p. 601) to be "Kulu Kulu."

An example of this Fruit-Pigeon was deposited at the London Zoological Gardens in 1885.

Superb Fruit-Pigeon (*Ptilopus superbus*).

The adult male has the crown deep rich purple; sides and back of head, olive-green; sides and back of neck, bright reddish; shoulders, blue-black; remainder of upper surface and wings, olivaceous-green; the scapularies, inner greater coverts, and inner secondaries with deep blue subterminal spots; the flights are black, the primaries with narrow yellow outer edges, secondaries and greater coverts green edged with yellow on outer web; tail with greyish-white terminal band; chin and part of cheeks, pale grey; breast, grey with purple bases to the feathers, bounded behind by a black belt tinted with blue or green; abdomen white; flanks green, with two white bands; under tail-coverts white, with yellowish apical margin and a longitudinal green dash on their inner webs; under wing-coverts, greyish green; flights below, dark grey; tail below, dark grey, with white terminal belt; bill, olive-green, yellowish at the tip; feet, rose-colour; iris, yellow.

The female has no purple on the crown, but a dark blue spot on the occiput; the blue wing-spots less distinct than in the male, no blue patch on the lesser coverts near the bend of the wing; lower part of throat and breast grey and green, with no purple at the base of the feathers; no black belt behind the breast. Hab., Moluccan and Papuan Islands and North Australia.

Mr. Gould evidently knew nothing as to the wild life of this pigeon, but Dr. Ramsay states that the eggs obtained by Mr. Boyer-Bower in the bushes near Cairns, Queensland, are small compared with those of species of inferior size; they are two in number for a clutch, and are white, rather elongated, and pointed. The same gentleman, in another article, speaks of it as "tolerably abundant in all the scrub lands of the Herbert River and coast range. Their note is a broken 'coo,' prolonged into a rolling guttural sound at the end; they may be heard at least half a mile off. But, owing to the dense nature of the scrubs, the birds are at all times difficult to obtain, although not rare."

Mr. Campbell ("Nests and Eggs of Australian Birds," p. 665) says that according to Mr. Kendall Broadbent this Pigeon lays two eggs, "the note is very gruff, resembling the word 'whoot,' uttered at short intervals, and may be heard at a considerable distance from the spot of its emission." "The nest is made in a small bush, and constructed loosely of a few sticks, which just serve to retain the eggs when laid. The usual clutch consists of two eggs, which are generally visible to an observer from the ground."

On the other hand, Mr. D. Le Souëf procured several nests, each with a single egg only, and Mr. H. Barnard, in the season of 1896-97, obtained eight nests, in every instance containing one egg only. Mr. Campbell therefore concludes that one is the usual clutch. He describes the egg as "elliptical in form; texture of shell somewhat fine, excepting the smaller end, which is slightly granular; surface glossy; colour, white, slightly toned of a faint creamy tint. Dimension in inches: (1) 1.22 × .88, (2) 1.15 × .87."

As with other Doves, the male incubates during the daytime. The breeding season is from September to February.

Our Zoological Gardens received this lovely Fruit Pigeon in 1865, and Dr. Russ, in his most recent work, published in 1899, states that it has been found alive nowhere else. In spite of the difficulty of securing it, one would suppose that after the first living example had been obtained an effort would have been made to capture others, for undoubtedly there could not fail to be a market for such handsome birds, and they would command a tolerably high price.

Painted Fruit-Pigeon (*Ptilopus coronulatus*).

Green shot with golden; wings glossy green, tinged with bluish; greater coverts and flights edged with yellow, more broadly on the inner secondaries; tail above glossy green, the feathers towards the tips with narrow yellow edges; crown rosy-lilac, edged behind with deep purple and encircled by a yellow band, which is broadest behind; sides of head greyish-green; chin and throat yellowish; a lilacine-violet patch on middle of abdomen; vent and under tail-coverts yellow; wings below grey; the under wing-coverts slightly greenish; tail below grey, with paler terminal band; bill olive-green; feet purplish red; irides with an inner red ring and an outer yellow one. Female with the yellow of abdomen and under tail-coverts paler. Hab., Aru Islands and South-eastern New Guinea.

This is also known as the Lilac-crowned Fruit-Pigeon. Dr. Meyer, in 1892, described a race of it from German New Guinea under the subspecific name of *huonensis*.

Mr. D. Le Souëf (*The Ibis*, 1900, p. 616) says: "These beautiful little Green Fruit-Pigeons are most difficult to detect among the thick foliage in which they make their home, and one is fortunate to be able to secure a specimen. They have the curious habit of laying their single egg on the leaf of a palm-tree, as when these large leaves branch out horizontally they are slightly concave, and often have a few dead leaves and twigs on their surface that have fallen from the surrounding trees. This Pigeon just lays its egg on the leaf, but

* The food mentioned at the end of my notes on the family *Treronidæ*

makes no nest of any kind, and directly anyone approaches the sitting bird darts off and flies away as if wounded, and is soon lost to sight; but Mr. Barnard succeeded in securing one bird as it flew off its egg, which was on a palm-leaf about 3½ft. from the ground. The egg is creamy-white and an elongated oval, and measures 1.24 × 0.72 inch."

An example of this extremely rare Fruit-Pigeon was deposited at the London Zoological Society's Gardens on August 17th, 1909.

Beautiful Fruit-Pigeon (*Ptilopus bellus*).

Bronzy green; scapulars with rounded bluish-black spots in the middle; primaries dark greyish-green, narrowly edged with white; secondaries and tail-feathers with narrow yellow edges, the latter otherwise green; back and sides of head of a deeper and brighter green than the rest of the upper surface; front of head and middle of lower breast purplish-red; a crescentic pectoral band, yellow in front and white behind; lower abdomen and under tail-coverts green with more or less yellow edges to the feathers; tail below dark grey, with a pale grey terminal band; bill yellow; feet dark carmine; irides yellow. Female green; crown and sides of head deeper and brighter; no blue-black spots on the scapulars; no purple on the front of head and middle of lower breast, and no crescentic band on the chest. Hab., New Guinea.

Dr. Guillemard states ("Proceedings of the Zoological Society," 1885, p. 658) that this bird is not, as had been previously supposed, confined to the mountainous districts. This is all I have come across respecting its wild life. An example was presented to the Zoological Society of London by Sir William Ingram in July, 1908.

Black-headed Fruit-Pigeon (*Ptilopus melanocephalus*).

Green; primaries black on inner webs, the first primary slightly scalloped and narrowed at tip; head and neck ashy, with the back of head and neck black; chin and throat pale lemon-yellow; vent and short under tail-coverts yellow, long ones carmine; edge of eyelids pale yellow; bill greenish-yellow; feet vinous-red; irides with an outer ring of pale yellow, a middle one of dark grey, and an inner one of pale grey. Female smaller than the male, the throat greyish; the abdomen broadly streaked longitudinally with ashy greyish, the feathers edged with yellow fringes; only the longest of the under tail-coverts carmine; otherwise wholly green. Hab., "Java, Flores, Sumbawa, Sumba, and Lombock." (Salvadori.)

Mr. H. O. Forbes states (*The Ibis*, 1881, p. 154):—"Irides dark yellow; cere round eye bright yellow. Hard seeds of some species of *Acacia* in stomach. 'He-kejoam.'"

The London Zoological Society purchased two females of this species in 1865, a male in the year following, and two other examples in 1872. Russ states that it has also been represented in the Amsterdam Gardens.

Red-crowned Fruit-Pigeon (*Alectrœnas pulcherrima*).

Blue-black; the reflections best marked on the back and upper wing-coverts; upper back grey; wings and tail black; feathers of crown hairy and carmine; sides of head, neck, and upper breast grey, darkest on the ear-coverts, the feathers long and pointed; vent and under tail-coverts yellowish-white, the latter with longitudinal dark green spots on the inner webs; naked orbital skin, lores, and wattles on sides of forehead red; bill dusky black, whitish at tip; feet greyish olive; irides red. Female very slightly smaller, her bill shorter and noticeably broader at base; the plumage less lustrous, the blue reflections being less pronounced. Hab., "Seychelles Islands—Mahé, Silhouette, Praslin, Marianne, and Felicité." (Salvadori.)

I have found no notes on the wild life, but it is probable that, like *A. sganzini*, it is an unsuspicious bird, and therefore easily shot, and that it feeds upon wild figs.

According to Herr Blaauw, who possessed a pair of this pigeon in 1883, its note is a deep murmur, or not unlike the bark of a small dog, and sounds like *wock, wock*. It moves very awkwardly on the ground to which it does not willingly descend. Two examples reached the London Zoological Gardens in 1865, one in 1868, eight in 1874, and four at least have been received subsequently; it first reached the Amsterdam Gardens in 1885, and Russ tells us that a pair existed in the Berlin Gardens.

Pacific Fruit-Pigeon (*Globicera pacifica*).

Above bronze-green, more or less tinged with blue; head and hind neck pale grey, the latter sharply defined from the green mantle; margin of forehead and feathers at base of bill and chin whitish; fore-neck, breast, and abdomen pale vinous; sides, flanks, and tibial feathers grey, the last with a vinous tinge; under tail-coverts chestnut; under wing-coverts ashy; flights and tail below brownish-black; bill and basal knob black; feet red; irides unknown. Female smaller than male, its bill broader at the base, and possibly with a smaller roughened knob at the base. Hab., Samoa Islands on the east to New Guinea.

E. L. Layard says ("Proceedings of the Zoological Society," 1875, p. 438): "This large Fruit-Pigeon is not nearly so common as the two preceding" (*C. vitiensis* and *C. latrans*), "but it frequents similar places, and cannot be distinguished from them by voice or appearance when at a distance. It breeds in December, and its eggs, sent me from Wakaia, are pure white." According to the Rev. S. J. Whitmee (t.c., p. 495), the native name of the bird appears to be *Lupe*.

According to A. J. North ("Records Australian Mus. III.," n. 4, p. 85), this is the Fruit-Pigeon of Funafuti.

In his "Ornithological Notes in the New Hebrides" (*The Ibis*, 1900, p. 607), Captain A. M. Farquhar, R.N., says: "The forest here abounds in the fine pigeon *Globicera pacifica*, the loud booming note of which may be heard at a great distance. When looking for small birds, I found great difficulty in preventing the natives taking me after these pigeons, as they could not understand why I should trouble about such insignificant little things as Honey-eaters, Flycatchers, *Zosteropes*, etc., when there was bigger game about. *Globicera pacifica* has an extraordinary large lump at the base of the bill. Later on, at Erromanga, I shot a good many pigeons of this genus, and I then noticed that the Erromanga bird differs considerably in colouring, and that the lump on the bill is much smaller than in *Globicera pacifica*."

According to Col. Gudgeon (*The Ibis*, 1905, p. 599), "the native name of this Fruit-Pigeon is 'Rupe.'" It will be noticed that Mr. Whitmee says it is "Lupe." Mr. Scott B. Wilson, writing on "Birds of Tahiti and the Society Group," calls it "Rupé," and he adds (*The Ibis*, 1907, p. 377): "During my visit to the island of Rarotonga I obtained several specimens. In their crops were banyan seeds, and I was told that they feed on the wild plantain and the banana. I fear that this bird is likely to become extinct shortly, as its flesh is highly esteemed by the natives, particularly when made into soup, while wild cats and the frequent cyclones,

which destroy the forest trees, are also contributing causes to its extinction."

This Pigeon first arrived at the London Zoological Gardens in 1862, and two more examples were added four years later; several others have since been acquired.

Vinous-throated Fruit-Pigeon (*Globicera rufigula*).

Neck and upper mantle grey; back, rump, upper tail-coverts, and wings brilliant bronzy-green tinged with blue; primaries with black inner webs and deep steel-blue outer webs; tail above deep steel-blue with blue edges to the outer webs; head and upper breast grey; cheeks, ear-coverts, and throat pale vinous; chin whitish; breast vinous, becoming chestnut on abdomen and vent; under tail-coverts cinnamon; under wing-coverts grey; primaries below darker grey; tail below brownish-black; bill black, the basal knob and the feet probably red; eyes dark red. Female probably smaller, and with its bill broader at the base than in the male. Hab., Solomon Islands.

Brenchley ("Cruise of the Curaçoa," p. 265) mentions the fact that the natives of San Cristoval, where he obtained this species, "had eyes like lynxes, and could discover from a great distance, though the day was anything but clear, the pigeons which were in the trees hidden by the leaves." He adds: "I brought back a dozen pigeons, of which, by the way, the flesh was not very well flavoured. I have taken the colouring of the soft parts above from the description by Salvadori, but in the "Proceedings of the Zoological Society" for 1887, p. 332, the bill, wattle, legs, and iris are stated, on the authority of the collector, Mr. C. M. Woodford, to be red; and as Mr. Woodford was a careful collector and an excellent observer, we must conclude that his account is accurate, at any rate as regards the specimens of this pigeon to be found on the island of Malayta, though of course it is possible that the colouring of the soft parts may differ on San Cristoval.

An example of this fruit-pigeon was presented to the London Zoological Society in 1885 and a second in 1889.

Wharton's Fruit-Pigeon (*Carpophaga whartoni*).

Above metallic bronzy green, some of the feathers with bluish edges; flights blackish on inner webs; frontal edge whitish; forehead, crown, cheeks, and throat dark grey; lower throat metallic green; breast and abdomen deep vinaceous purple, becoming grey at the sides, on the tibial feathers, and vent; under tail-coverts chestnut; under wing-coverts dark grey shot with greenish; flights below dark grey; tail below blackish-brown; bill black; feet crimson. The female is probably smaller than the male. Hab., Christmas Island. Dr. C. W. Andrews says ("A Monograph of Christmas Island," p. 38):—"The large Fruit-Pigeon, called by the Malays 'Pergám,' is very common over the whole island, but is much more often heard than seen, since it lives among the thick foliage of the tops of the lofty forest trees, where, to the unpractised eye, it is extremely difficult to discover. In addition to the ordinary cooing note the male utters a deep booming cry which is the most striking of the forest sounds during the daytime. This note is said to resemble closely the noise made by tigers, and Mr. Ross told me than an old Bantamese woodcutter who came to the island was at first afraid to enter the forest, and was with much difficulty persuaded that a bird was responsible for the sound. These birds are very tame, and when a number were feeding in a tree it was generally possible to shoot several, one after the other, without disturbing the rest. The boys in the island used to catch them with a noose of string at the end of a long stick, and the birds would sit quietly while the instrument of their destruction was prepared, and the boy climbed into a convenient position for using it. On one occasion I caught one with my hands while it was drinking at a puddle on a tree trunk.

"The food is the fruit and leaf-buds of the various forest trees, and the birds gather in great numbers in trees of which the fruit is just ripening. The feet are very powerful, prehensile organs, and, while feeding, this Pigeon clambers about among the branches like a Parrot. The nest is a very scanty structure of sticks placed high up in a tree. The eggs are two in number, white and elongated, with both ends alike. I saw a pair building on December 24, and obtained an egg on January 6. Many young birds were shot in April. There seem to be two broods a year, for in the middle of November there were also great numbers of young birds, characterised by their looser, duller plumage and grey legs; in the adult the legs are a bright red. I have counted between fifty and sixty on the bushes round the small waterfall on the east coast. The year before I visited the island was a very dry one, and Mr. Ross informed me that great numbers of these Pigeons had died of thirst."

Two examples of this species were added to the collection at Regent's Park in October, 1903.

Nicobar Imperial Fruit-Pigeon (*Carpophaga insularis*).

Upper mantle grey; back, rump, and wings dark metallic green, more or less tinged with bluish; flights above black, dusty dark greyish-green on outer webs; tail above dark bluish-green; head, neck, breast, and abdomen grey, the forehead rather paler and not tinged with vinaceous; under tail-coverts dull chestnut, more or less shading into dark green, especially on the longest feathers; flights below brownish-grey; under wing-coverts grey shot with greenish; tail below blackish-brown; bill pale leaden-grey, the tips lighter, the base and cere darker; feet dull deep pink, pinkish-red, or livid purple; irides sometimes pale ruby-red, sometimes clear, sometimes dull lake-red; eyelid pale lavender. Female not differentiated, probably smaller than the male. Hab., Nicobars.

Hume says ("Nests and Eggs of Indian Birds," Second Edition, Vol. II., pp. 367, 368): "Mr. Davison remarks of this species that 'they breed in February and March. On Feb. 17 I found a nest on the Island of Trinkut. It was built in a cocoanut palm, and was about 20 ft. from the ground. As usual with Pigeons and Doves, it was simply a platform of dry twigs very loosely put together, and was built on a dried-up fruit branch, which was itself merely a mass of dry twigs. It contained one large white egg. It is my belief that the normal number of eggs laid by this pigeon is only one. This certainly is the case with *Calœnas nicobarica*, for I must have examined at least a couple of dozen nests, and in no single case was there more than one egg or one young one; and I have found that one egg was the usual number laid by *Palumbus elphinstonii*, and I was informed by several convicts that they usually obtain only one young one from the nests of the present species and those of *C. bicolor*.'

"The egg which Mr. Davison obtained is pure white, a very regular, moderately broad oval; the shell smooth and satiny, but with very little gloss. It measures 1.9 in. by 1.39 in."

Specimens of this species were received by the

London Zoological Society in July, 1901, and in 1904 and again in 1905 one young one was hatched in the gardens, the later one being apparently successfully reared.

Blue-tailed Fruit-Pigeon (*Carpophaga concinna*).

Back, rump, upper wing and tail coverts, metallic golden-green somewhat shot with blue; flights steely blue-black, the secondaries brighter; tail above metallic steely blue; head, neck, breast, and abdomen pale grey; frontal edge whitish; back of head and nape tinged with pale vinous; under tail-coverts chestnut; under wing-coverts dark grey, shot with golden-green; flights below slaty-black; tail below black; bill dark horn-colour; feet vinous-red; irides pale yellowish-orange; eyelids pale with a white edge. Female rather smaller. Hab., "Tenimber Islands, S.W. Papuan Islands—Aru and Ké Isl.; Moluccas—Tejoor, Matabello, Monawolka, Pandjang, Goram, Banda, Batang Kitjil and Sanghir Islands" (Salvadori).

I have discovered no field-notes relating to this species. An example reached the London Zoological Society's Gardens in November, 1900, and two others in October, 1904.

Red-naped Fruit-Pigeon (*Carpophaga paulina*).

Back, upper tail-coverts and upper wing-coverts metallic golden-green; flights above metallic greyish-green; tail metallic green; head, neck, throat and under surface generally pearly-grey, the vertex, throat, and abdomen with a roseate suffusion; forehead whitish; nape coppery-chestnut; under tail-coverts chestnut; under wing-coverts grey; tail below dark grey; bill leaden-blue, red from above nostrils to base; feet vinous-red; irides deep red; eyelids red. Female smaller, her bill a trifle longer and more slender; the under surface more uniformly coloured. Hab., Celebes and Sula Islands.

Dr. Guillemard ("Proceedings of the Zoological Society," 1885, p. 557) thus describes the soft parts: "Iris indian-red; tarsus red; bill in male bluish-green, with a red patch at the base of upper mandible. The female is without this." "Native name, *Kum-kum*."

Russ says: "In the years 1874 and 1880 it arrived at the Zoological Gardens of London, and in the year 1894 a pair was present at the exhibition of the 'Ægintha' Society of Berlin."

Bronze Fruit-Pigeon (*Carpophaga ænea*).

The adult male has the head, neck, breast, and abdomen vinous-grey; frontal margin and chin, whitish; back, rump, upper tail-coverts and wings bronze green; flights and tail above bluish-green; under tail-coverts deep chestnut; flights and tail below blackish; bill grey, dull red at base; edges of eyelids and feet purplish-red; iris red. The female is smaller than the male, and the plumage of the under surface is more uniformly coloured. Hab., India, Ceylon, the Andaman Islands, Burma, and Malaysia, Cochin China, Hainan, the Sunda Islands, Philippines, and Sulu Islands.

This bird inhabits low-lying forest regions, and was formerly believed not to occur at a higher elevation than 1,500 ft. Mr. C. Hose, however, obtained it up to 2,000 ft. on Mount Dulit, where its native name is "Pergum" (*vide The Ibis*, 1893, p. 421). Mr. F. Lewis, writing of it as observed in the Sabaragamuwa Province, Ceylon, states (*The Ibis*, 1898, pp. 549, 550): "It is found in both the very wet as well as in very dry parts of it. I have found it up the valley of the Kaluganga river, the Wallaway river, the Kalani river, and the Maha Oya stream, but it is met with in greatest abundance in the Kolonna Korah, where it is often to be found in large flocks. I have questioned many natives on the nidification of this well-known pigeon, but beyond a vague statement that it nests on the tops of very high trees, I am unable to give any satisfactory evidence."

Mr. W. Eagle Clarke, writing on birds of the Island of Negros (*The Ibis*, 1900, p. 358), says: "The Bronze Fruit-Pigeon is very common, and nests in high trees in the mountains. It visits the mangrove-swamps near the coast daily in great flocks, 'thousands upon thousands of them.' The native name is 'Balud.'"

Its note is said to resemble the syllables "wuck-wooor," the second note being sepulchral in character, and is generally heard most about 10 o'clock in the morning. In Ceylon its favourite food consists of the berries of the bob tree and the ironwood, and the branches of these trees may be seen laden with the birds when the fruit is ripe; they are also fond of wild nutmegs, the mace of which they digest, regurgitating the nutmegs.

From the little that is known respecting the nidification of this common fruit-pigeon, it appears that it builds a slight nest of sticks and stiff grasses in April or May, and lays two broad oval pure white eggs. In this respect it differs from most other members of the genus, which only lay one egg.

This species reached the Amsterdam Zoological Gardens in 1838; in 1866 the first example was secured for the London Gardens, a second being presented in the year following, three being received in exchange in 1871, and one presented in 1878. Others have been added since that date. In 1879 Dr. Platen brought home eighteen specimens from the Malay Archipelago, and sold them at the rate of 40 marks the pair. Both Landauer and A. E. Blaauw possessed specimens, and the latter gentleman states that when once acclimatised this bird becomes very enduring, and may be kept out of doors both in summer and winter. A pair of the Philippine race (*C. chalybura*) was imported by Mrs. Johnstone in 1903.

Russ regards *C. sylvatica* as distinct, and says that it differs in the pure white colouring of the upper throat and region of the bill and eyes, and by its superior size; he says it has only once reached Europe alive, and that was in 1875, when it arrived at the Zoological Gardens of Amsterdam. On the other hand, Salvadori tells us that *C. sylvatica* "has smaller dimensions."

Brown-tailed Fruit-Pigeon (*Carpophaga latrans*).

Back and rump dark brown; scapulars, upper wing and tail coverts dark glossy greyish-brown; primaries greyish-black; secondaries brownish-black suffused with greyish, the base of the inner webs of all the flights rufous; tail above reddish-brown; head and neck ashy; back of head, throat and breast vinous grey; lower abdomen, vent, and under tail-coverts, pale reddish buff; under wing-coverts chestnut; flights below conspicuously rufous at base of inner webs; tail below paler than above; bill black; feet reddish-brown; irides blood-red or purplish-red; eyelids carmine. Female smaller than the male and more uniformly coloured on under surface. Hab., Fiji Islands.

E. L. Layard ("Proceedings of the Zoological Society," 1875, p. 438) says: "The 'Barking Pigeon' of the settlers is generally distributed. To give some idea of the gastronomic powers of these large Pigeons, I annex the size of two seeds found in the crop of one, axis 4″, circum. 3″ 6‴; axis 5″, circum. 3″. This was only the hard, wood part; *the pulp had been digested!*

"This bird is called 'Sonki,' or "Songi,' by some natives, especially about Taviuni. It has fourteen tail-feathers. Mr. Storck writes from the Rewa that it feeds largely on the wild nutmeg, the large drupe-like seeds of some Laurinaceous forest trees, and the fruits of both the Kaufia Pakus.

"I have received eggs laid in April, pure shining white, axis 1″ 10‴, diam. 1″ 3‴. Some natives say they only lay one egg; but this I doubt.

Mr. M. J. Nicoll (*The Ibis*, 1904, p. 63) describes the soft parts as follows: "Iris red; bill dark brown; tarsi and toes dull red." The London Zoological Society purchased two examples of this Fruit-Pigeon in April, 1866; it does not appear to have been imported more recently.

Nutmeg Fruit-Pigeon (*Myristicivora bicolor*).

The adult bird in both sexes is creamy-white; the bastard wing, the flights (except the tertiaries), the primary coverts, and the terminal part of the tail black, the central feathers being about half black, this colour decreasing towards the outermost pair, in which only the tip and part of the outer web are black; bill, leaden blue, dark at the tip; feet, smalt-blue; iris, dark brown. The female has a more slender bill than the male. Hab., Mergui and the Andamans eastward to the Philippines and southward to Java, and perhaps Christmas Island, also the Australian portion of the Malay Archipelago.

This bird is said to be rather difficult to secure, from the fact that it affects chiefly the summits of the highest trees. It is sometimes seen in small companies of from twelve to twenty individuals; it lays a pure white egg. In Borneo it appears to be sometimes called "Burong-rawa," and sometimes "Peagam rawa."

Captain Wimberley (quoted by Hume, "Nests and Eggs," Vol. II., p. 369) says: "I obtained this egg on Trinkut Island (Nicobars) during the first week of February. The nest was built of sticks and twigs, and was very similar to that of our English Wood-Pigeon. There was only one egg in the nest, and it was much addled. The nest was placed in a low mangrove-tree overhanging the river, and the old bird flew off the nest as I drew near to it, but I failed to shoot it." Mr. Hume says: "The egg is of a longish oval shape, a good deal pointed towards the small end, pure white, and tolerably glossy. It measures 1.78 by 1.25." According to Mr. Davison the breeding-season is from January to March. It usually lays only one egg.

The Nutmeg Fruit-Pigeon is the only member of the family which I ever had an opportunity of acquiring, and I resisted the temptation without much difficulty. As Dr. Russ tells us, it only comes into the market now and again, having reached the Amsterdam Gardens in 1859, those of London in 1867, and those of Berlin in 1893. For a pied bird I prefer the small and easily kept Tambourine Dove; mere rarity does not appeal to me much.

Spotted Fruit-Pigeon (*Myristicivora spilorrhoa*).

Differs from the preceding in having regular sub-terminal black spots on some of the flank-feathers covering the thighs, on those of the vent and on the under tail-coverts. The plumage is sometimes more or less tinged with grey. Hab., Australia, Eastern Papuan Islands, Eastern New Guinea, also Western New Guinea, and Aru Islands.

According to Gilbert, this pigeon "pairs and commences breeding immediately after its arrival in November. The nest is formed of a few sticks laid across one another in opposite directions, and is so slight a structure that the eggs may usually be seen through the interstices from beneath, and it is so flat that it appears wonderful how the eggs remain upon it when the branch is waving about in the wind; it is usually built on a horizontal branch of a mangrove, and it would seem that it prefers for this purpose a branch overhanging water. That it never lays more than one egg appears to me without a doubt, for on visiting Tablehead River, on the eastern side of the harbour of Port Essington, I found no less than twenty nests, all of which contained either a single egg or a single young bird."

Mr. A. J. Campbell describes the egg as "elliptical in shape; texture of shell somewhat coarse, especially on the smaller end; surface slightly glossy; colour, pure white. Dimensions in inches (1) 1.76 by 1.24, (2) 1.7 by 1.18."

Mr. E. Olive says (*The Ibis*, 1900, p. 647): "Abundant at Cooktown during the winter months; breeding in enormous multitudes on the outlying islands of the Barrier Reef, some eight or nine miles from the mainland. In the early morning they wend their way to their feeding-grounds in the scrubs, sometimes flying as great a distance as forty miles, and return to roost on the islands at night. They feed principally on a species of nutmeg (*Myristica insipida*), of which I have found as many as eight or nine fruits in the crop. Iris dark brown; feet bluish-slate; bill greenish-yellow."

Miss Rosie Alderson possessed an example of this species supposed at first to be the more frequently imported Nutmeg Pigeon.

White Fruit-Pigeon (*Myristicivora luctuosa*).

Differs from *M. bicolor* in the black-edged slate-grey colour of all the flight-feathers; some of the flank-feathers covering the thighs, the feathers of the vent, and the basal under tail-coverts, with large black spots. Hab., Celebes and Sula Islands.

Dr. Guillemard ("Proceedings of the Zoological Society," 1885, p. 557) describes the soft parts as follows: "Iris dark brown; bill bluish-green, yellow at the tip; tarsus bluish-green."

Doubtless the wild life of this species closely resembles that of the two preceding species. Russ confounds it with *M. spilorrhoa*, so that his statement that it reached the Amsterdam Zoological Gardens in 1857 may apply either to that or the present species. One specimen was presented to the London Zoological Society in 1867, and four were purchased in 1870.

Double-crested Fruit-Pigeon (*Lopholæmus antarcticus*).

General plumage of adult bird, including the frontal crest, grey, darker above than below; a line of black from each eye to the occiput, which unites posteriorly, and is continued a short way down the back of the neck; sides of head rust reddish; feathers of chin elongated; those of neck and breast hackled; quills black; inner secondaries grey; tail black, grey at base, and crossed by an irregular band of buffish-grey about an inch from its extremity; bill bright rose-red, lilacine at tip, the cere and base of lower mandible greenish-leaden in the male, but lead colour in the female; feet purplish-red, greyish-brown at the back and on the soles; iris fiery orange, with rosy lashes; a bare mealy pink patch surrounding eye. Female, in addition to difference already noted, probably smaller and with rather less developed crest. Young with shorter crest, a narrower and less defined band on tail. Hab., Eastern Australia, from Cape York to Tasmania.

A very gregarious bird, which is often seen passing over the forests and brushes in flocks of many hundreds

in search of its favourite fruit; the entire flock, according to Gould, settling down simultaneously as soon as it is discovered, so as to bend down the smaller twigs and branches with the weight. Wild figs, the berries of the cabbage palm, and probably larger fruits are devoured by it.

The nidification is thus described by Mr. A. J. Campbell ("Nests and Eggs," p. 671):—"*Nest.*—A platform of fairly stout twigs placed in a tall tree. Dimensions, 8in. to 10in. across, by about 3in. in thickness. *Eggs.*—Clutch, one; elliptical in form, with sometimes the ends peculiarly pointed, especially the smaller, which nips off suddenly; texture of shell somewhat granular; surface glossy; colour pearly white. Dimensions in inches: (1) 1.76 × 1.21, (2) 1.65 × 1.14, (3) 1.64 × 1.16."

Mr. Campbell tells us that in the Richmond River district Mr. S. W. Jackson "found two nests similarly situated at a height of 115ft., in some tall fig trees that stood in a clearing, and was enabled to circumvent the fine birds by reaching their nests with the aid of his ingeniously made rope ladder. As the ladder only reached about half way it had to be drawn up and shot the remaining distance—a very difficult, not to say dangerous, undertaking, which occupied nearly the whole day to accomplish. An unfortunate loss of time occurred on account of the second nest not being discovered until *terra firma* was regained after the first nest was robbed, which necessitated a second day's work. There was one egg in each nest."

Mr. Campbell says that the "Top-knot Pigeon" utters a somewhat gutteral double call, resembling "Quook-quook."

According to Dr. Russ, this remarkable Fruit-Pigeon has only been owned hitherto by our London Zoological Gardens, which received the first example in 1864, but has subsequently obtained others. Considering that it is sometimes seen in flocks numbering thousands of individuals, it is strange that so very few are imported. Though somewhat sombrely coloured, its crest renders it an interesting species, which doubtless many aviculturists would like to possess and try to breed.

This species brings us to the end of the imported Fruit-Pigeons, and we now pass on to the more familiar Typical Pigeons.

CHAPTER XVI.

TYPICAL PIGEONS (*Columbidæ*).

In this family only the hind toe has the skin much expanded at the sides. The tail has twelve feathers. Three sub-families are recognised—*Columbinæ*, *Macropygiinæ*, and *Ectopistinæ*; these are characterised by the length and form of the tail.

In their wild state these birds feed upon grain, beech-nuts, acorns, berries, small wild fruits, young green shoots, smooth caterpillars, various grubs, and earthworms. In captivity maize, wheat, dari, millet, tares, a little hemp, and small white peas, with a little chopped green food and a few small earthworms or smooth larvæ of various insects, suit them well.

White-backed Pigeon (*Columba leuconota*).

Upper back, scapulars, and lesser upper wing-coverts brownish-grey; lower back white; rump and upper tail-coverts dark brown; median and greater wing-coverts grey; flights grey, with the tips and outer webs brownish; a brown band across the median coverts, a second across the greater coverts, and a third across the inner secondaries; tail blackish-brown; near middle of two central feathers and towards tips of lateral feathers a broad whitish band; the outer feather white at base of outer web; head dark slate-grey; neck and under surface white, pearly ash-coloured on the flanks, lower abdomen, vent, and under tail-coverts; under surface of wings also pale grey; axillaries white; bill horn-black; feet bright pale red; irides yellow. Female slightly smaller, the grey colouring of the back and wings somewhat duller, the back browner, the nape less white; abdomen smoky instead of pearly ash-coloured. Hab., Yarkand and Cashmere, through the Himalayas to Thibet.

Jerdon says of this Pigeon ("Birds of India," Vol. III., p. 472) that it "is stated to frequent rocky heights and sequestered valleys, from 10,000ft. to the snow level, in large parties. "It feeds in the fields, returning to the rocks to roost, and is said to be shy and wary."

Lieut. W. W. Cordeaux says (*The Ibis*, 1894, p. 373): "Common from 11,000ft. and upwards in Kaschmir and Ladakh. I found it breeding among the inaccessible crags of the Ai nullah in August."

Mr. J. Davidson (*The Ibis*, 1898, p. 38) observes: "This beautiful Pigeon was very common in the beginning of May on the Sonamurg plateau, and occasionally among the cultivation along the Sind River as far down as Kulan. It was then in small flocks. During June we saw it occasionally at Sonamurg, singly or in very small flocks. It seemed generally to fly to and from a ridge of rocks not far from the nullah joining the Sind River, close to the village of Sonamurg. We intended to visit these rocks, but never were able to find time."

Speaking of the Cage-Birds of Calcutta (*The Ibis*, 1901, p. 443), Mr. Frank Finn says: "The Alpine *Columba leuconota*, which Mr. Rutledge sometimes obtains, bears the heat perfectly well, and even shows a desire to breed. As its note has apparently not been recorded, I may mention that it is not a coo, but a repeated croak, not unlike a hiccough, and, much as the bird resembles the domestic pigeon, I have never seen it sweep the ground with its tail when courting, but rather raise it."

Writing on the Birds of Southern Tibet (*The Ibis*, 1906, pp. 245, 246), Capt. H. J. Walton says: "Snow-Pigeons were in large flocks in the Chumbi Valley in January. The bird does not appear to occur in the country north of the Himalayan Passes."

In 1876 Baron von Corneley bred this species in the park of Castle Beaujardin at Tours. In the same year three examples were purchased by the London Zoological Society, a fourth was added in the following year, and many others have been received since that date.

Indian Stock-Dove (*Columba eversmanni*).

Dark ash-grey, much whiter, sometimes quite white, on the rump; two or three black spots, forming rudimentary bands, on the wings; tail black at the tip; the outermost feather with the basal two-thirds of the outer web white, a black followed by a narrow grey band towards the tip; crown and breast tinted with vinaceous; back of neck with metallic cupreous reflections; wings below whitish-grey; bill pale yellowish-green; base of lower mandible and gape slaty; feet yellowish-flesh-coloured; irides deep yellow. Female probably smaller. Hab., "W. Siberia, through

Turkestan and Afghanistan, to N. India" (Salvadori); "Southern Persia?" (Blanford).

Jerdon says ("Birds of India," Vol. III., p. 468): "It flies in pretty large flocks, and affects trees. A correspondent of the *Bengal Sporting Review* states that he saw them in hundreds at Hansi in March, 'but they soon disappeared. They feed in the fields, morning and evening, and roost in the day (and, I suppose, the night also) in trees, generally in the common Babul trees. To Europeans here (at Hansi) they are known as the Hill-pigeons."

Lieutenant C. H. T. Whitehead (*The Ibis*, 1909, p. 266) says of this species: "Migrates through Kohat in the latter half of April in small flocks, which feed chiefly on the mulberries that are then ripening. Less wary than other members of the genus. Appears to be scarce in the Kurram Valley, and probably only passes through. I shot an example at 6,500 feet in Ilex-scrub on May 2nd."

Three examples of this species reached the Gardens at Regent's Park on June 24th, 1896.

Triangular-spotted Pigeon (*Columba guinea*).

The principal colour is ashy-grey, paler on the rump; the neck is vinaceous-reddish, the tips of the feathers bifid and ashy, glossed with green; the scapulars, upper wing-coverts and back vinous-chestnut, with numerous triangular white spots; flights smoky-greyish, darker underneath; tail grey, with a broad apical black band; basal half of outer web of outside tail feathers white; bill blackish; feet red; bare skin round eye blood-red; iris red. The female is rather smaller than the male, and her bill is probably more slender. Hab., Western Africa, across Central Africa, and on the Eastern side up to Abyssinia, Sennaar, and Kordofan.

This bird (according to Von Heuglin) in its wild state is most accommodating, frequenting both mountain and plain, houses, ruins, and trees, open places and forests. In Abyssinia it is a common domesticated pigeon, therefore it is not surprising that it has been frequently bred in our Zoological Gardens. It builds freely on the roofs of buildings or in the leaf sheaths of *Doleib* palms. It may be seen either in pairs or small companies, feeding upon the roads or in the stubbles, and in the evening it alights to drink. The note of this bird resembles that of our Rock Pigeon. Breeding is carried on in our winter.

According to Lord Lovat (*The Ibis*, 1900, p. 332): "This widely-distributed pigeon nests in the rocks" in Abyssinia. He thus describes the soft parts: "Iris red, round pupil dark red; bill dark; legs pinkish." Mr. Alfred E. Pease, however (*The Ibis*, 1901, p. 696), describes them as follows: "Iris orange; bill black; naked skin round eye dark purplish-red; legs pale red."

Captain B. Alexander says (*The Ibis*, 1902, p. 369), speaking of the birds of the Gold Coast: "During the dry season, from November to the beginning of April, these pigeons are seldom seen in the Hinterland, but as soon as the first rain has fallen they appear on the newly-sown fields in large flocks, and may be seen from early morning till evening."

Mr. A. L. Butler, writing respecting the ornithology of the Egyptian Soudan (*The Ibis*, 1905, p. 359), says: "The Maroon-backed Rock Pigeon is common in the rocky gorges of the Upper Atbara, from which it ranges into the surrounding district. I have shot it at Gedaref and Gallabat, and have seen it also at Tewfikia, on the White Nile, where I noticed it feeding about the town almost as tamely as a domestic pigeon."

In a later paper (*The Ibis*, 1908, p. 248) the same observer says: "The Guinea Pigeon was, as usual on the White Nile, first met with among the "Doleib" palms at Tewfikia, and in the Bahr-el-Ghazal country we found it abundant wherever these palms occurred. I occasionally saw sixty or seventy individuals in a flock."

Miss Alderson once purchased a female of this species, and subsequently obtained a male from the Zoological Gardens, but she was not successful in breeding from them. She says the coo was more like the bark of a small dog than the note of a bird.

The London Zoological Society purchased two specimens of this species in 1865, and a pair the following year; many others have been acquired subsequently, chiefly by breeding the species year after year at the Gardens.

Naked-eyed Pigeon (*Columba gymnophthalma*).

Back, scapulars, and wings pale brown; lower nape with pale and dark-grey narrow bands in front and opaline and blackish bands behind; lower back and upper tail-coverts dusky-grey, the latter slightly brownish towards the tips; anterior wing-coverts broadly edged with white; primaries brown, with narrow paler edges; secondaries with narrow white edges; tail above sandy or drab-grey; head, throat, fore-neck, breast and abdomen pale rosy-vinaceous, fading to whitish on vent and under tail-coverts; under wing-coverts dull greyish; flights below greyish, darker towards the tips; tail below pale sandy-grey. Female probably smaller and with more slender bill. Hab., Curaçao, Aruba, Bonaire, and perhaps the coast of Venezuela.

Dr. E. Hartert (*The Ibis*, 1893, pp. 323, 324) observes: "In the living bird the bill is of a whitish flesh-colour; the iris deep orange-brown. Round the eye is a smooth bare ring of a bluish-grey colour; this ring is surrounded by a large granulated naked space of a dark reddish-brown colour, somewhat like an over-ripe strawberry. Feet raspberry-red. The lower surface of the bird is vinaceous-grey, shading into ashy on the flanks and belly. Thighs and under tail-coverts greyish-white. The broad white line along the wing has caused this bird to be named '*Ala blanco*,' or 'White-wing,' on these islands."

"This beautiful pigeon generally flies about in flocks, picking up its food from the ground, as well as from the trees. Its note is a deep cooing, consisting of four sounds. I found a fresh-made nest on July 23rd, but no eggs in it. I also shot young birds at this time, so I believe that they breed twice during the year. The nest is a loose structure, like that of *Columba palumbus*, and placed mostly in the mangroves, but sometimes in other trees. They are rather shy birds, but can be shot in great numbers in very dry weather near the water. The Europeans and natives on the islands much appreciate its flesh as food, and it does well in captivity."

Russ confounds this species with *C. picazuro;* and consequently his notes on the species are the less satisfactory, although they probably relate to this species and not to *C. picazuro*. He says: "This beautiful pigeon, rare in the market, reached the Zoological Gardens of London on several occasions since the year 1858, there also soon after its importation it was freely bred, and at various times hybrids between it and the Stripe-Pigeon (*Columba maculosa, Temm.*) were produced, as, for instance, four broods in the year 1875. The Amsterdam Zoological Gardens have also possessed it. M. Delaurier, senior, of Angoulême, wrote in the year 1884:—"A beautiful pigeon, which is long-lived, and with me passed the winter in the open. Male and female resemble each other. I used

up part of the summer in discovering a pair among several, and at length this pair supplied me in August with two young ones. In the Basle Zoological Gardens a pair was to be found in the year 1885, and in the year 1891 Fockelmann imported another."

The species which reached our Gardens in 1858 and bred freely was undoubtedly the Naked-eyed Pigeon, not the Picazuro; therefore it is probable that most, if not all, of Russ's remarks apply to the same species.

Picazuro Pigeon (*Columba picazuro*).

The prevailing colour of the adult male is rich vinous, but the back of the neck is grey, each feather with a pale subterminal and a black marginal bar; farther back the feathers are lilacine; the centre of upper back, scapularies and upper wing-coverts smoky brown, the coverts becoming greyer and white-edged outwardly; the greater coverts with broad white borders; quills grey, darker towards the tips; lower back, rump, upper and under tail-coverts, leaden grey; tail of the same colour but broadly belted with black; bill black; feet crimson; iris red. The female is probably rather smaller and with more slender bill. Hab., Paraguay, Uruguay, and Argentina.

In the breeding season this pigeon is met with in pairs, building its flat nest in hot low-lying woodlands and laying two white eggs similar to those of our Rock Pigeon. In winter it is seen in flocks of from a score to two hundred individuals. The coo consists of five long-drawn, intensely mournful notes, which are said to have a very human sound.

There is no doubt that in its wild state this pigeon feeds upon grain and young green shoots; it is very stately in its movements when on the ground; in August it appears to live principally upon clover leaves.

At night, like many pigeons, this species roosts on very lofty trees; it is a timid bird. Gibson says that it breeds in November and December, and that in six nests which he examined each contained only one egg; Hudson, on the other hand, declares that two are deposited, which is what one would expect in the case of a *Columba*.

Mr. W. A. Forbes says (*The Ibis*, 1881, p. 356) :—"This Pigeon is well known to the Brazilians as the 'Azu Branca,' or White-winged Dove. I was told it was sometimes abundant round Parahyba, and also heard of it at Quipapá, Garunhuns, and other places. However, I never succeeded in seeing it wild, though I got several living specimens at Parahyba and elsewhere."

Mr. O. V. Aplin remarks of it at Uruguay (*The Ibis*, 1894, p. 201) :—"A fairly abundant resident, living in the monte and visiting the chacras for maize both at seed-time and harvest. At these times it is very wary, and reminds one of the Wood-Pigeons at home by setting a sentinel on the fence. In the breeding-season they often frequent the tall gums about estancia houses, where their low, deep *coo* may be heard; it is a long, grating *oooook*, followed by *coo-coo-cooooo*. This magnificent Pigeon has the irides bright yellow; eyelids and small space behind the eye crimson; legs crimson. It is known as the 'Paloma,' and also as 'Torcasa grande.'"

Dr. E. Lönnberg, describing the bird as observed by him in the Bolivian Chaco (*The Ibis*, 1903, p. 459), describes the iris as "light grey," so that it is evident that, as with many other species, the soft parts differ in colouring in different parts of the bird's range, and probably represent the first steps towards differentiation and the evolution of fresh species.

The London Zoological Society purchased two examples of this species in 1868, and in 1875 three others were presented; it occasionally appears in the market, and is quite likely to have been privately bred.

Spot-Winged Pigeon (*Columba maculosa*).

This bird is slightly smaller and distinctly greyer than the preceding, the sides of the head deep grey; feathers of the mantle, scapularies, and upper wing-coverts sooty brown, tipped with triangular white spots; outer greater coverts bluish-grey, with white edges; quills grey-black edged narrowly with whitish; bill grey; feet red; iris grey. Hab., Paraguay, Argentina, and Patagonia.

This appears to be a commoner bird than the preceding, and is certainly more frequently imported; from its fondness for grain and its rapidity of movement when feeding it is said to be a great plague to the farmers, vast flocks settling down on the newly-sown fields and devouring the wheat before it has had time to sprout. The coo is described by Hudson as similar in number and length of notes to that of the Picazuro Pigeon, but much hoarser, like that of the English Wood-Pigeon.

White found this bird in flocks in paddocks and lucerne-fields, their crops being filled with young lucerne shoots.

Mr. O. V. Aplin says (*The Ibis*, 1894, p. 201) :—"Abundant in the wide monte of the Rio Negro, where it frequents chiefly parts where there are open glades. At Sta Elenait it was much less common, but I have shot it in the rincón of the Monzon and Arroyo Grande. The cry of this bird has a resemblance to that of our large Wood-Pigeon in sound and delivery, but has only three notes, *cooo . . . ko . . . coo-ooo*. The legs and feet of this bird are crimson, not yellow."

Dr. E. Lönnberg says (*The Ibis*, 1903, p. 459) :—"In great flocks near water, Colonia Crevaux, in April, 1902. Iris greyish yellow."

The first six examples of this species to reach the London Zoological Gardens were purchased in 1870, and were supposed to have come from Chili; another example was deposited in 1872. A good many have been bred in the Gardens up to 1902 : three in 1894, two in 1895, one in 1900, 1901, and 1902.

Olive Pigeon (*Columba arquatrix*).

Upper back, smaller scapulars, and inner half of wing-coverts deep purplish-chestnut, shading into leaden-grey on the rest of the wing-coverts; the smaller scapulars and lesser and median coverts spotted with white at the tips; flights brownish black; lower back and rump deep slate-grey, shading into black on the upper tail-coverts; tail also black; feathers at back and sides of neck partly showing their black bases; front of crown, cheeks, and neck deep vinaceous purple; back of crown grey; breast slaty-purple with whitish spots at tips of feathers; feathers between neck and breast deep purple, with broad vinaceous purple borders; abdomen, under tail-coverts, and under wing-coverts slate-grey; bill, feet, and naked orbital skin yellow; irides greenish. Female rather smaller and duller in colour, the vinous-purple of the neck greyer. Hab., South Africa to Abyssinia on the east, and to Benguela and Angola on the west.

According to Ayres the iris is yellow.

In Stark and Sclater's "Birds of South Africa," Vol. IV., p. 164, we read :—"This, the largest of South African Pigeons, is chiefly an inhabitant of the forest; it seems to be partially migratory in its habits, appearing in very large numbers at certain seasons of the year, when the forest fruits are ripe, especially those

of the wild olive tree; this is in November and December at Knysna, and in June, July and August near Durban. At other times of the year they appear to be dispersed about solitary or in pairs. They build the usual loose nest of sticks in trees, usually in mountain ravines, and lay two white eggs, measuring about 1.5 by 1.12. Atmore found nests in the top of tree ferns in the mountain ravines near Blanco in the George district, and Layard states that he was informed that they laid four eggs, only two of which hatched out. On the other hand, Major Sparrow tells me that, as a rule, only one egg is laid and hatched, and that this is somewhat rounded, and of a pale greenish tinge."

The Messrs. Woodward, writing on the birds of Zululand (*The Ibis*, 1898, p. 217), say: "Here we found plenty of pigeons in the trees. Of these *Columba arquatrix* is a fine bird, 13 in. in length, with bright yellow bill and legs, and, from its dark plumage, is popularly known as the 'Black Pigeon.' It seems to confine itself to the woods. We see more of them in the winter, when the berries are ripe; we have noticed tree-seeds in individuals killed."

Dr. S. L. Hinde, in a paper on birds observed near Machako's Station (*The Ibis*, 1898, p. 587), says of this species: "Very wild; common on bushy hills, but hard to get near."

Lord Lovat, speaking of it as observed in Abyssinia (*The Ibis*, 1900, p. 332), says: "Iris orange-red; bill, eyelids, and legs light yellow.

"The only two occasions on which we came across this pigeon was in thick forest. The food found in the crop consisted of berries, which it obtains by climbing about among the branches. It appeared to move about in the trees with greater ease than is usual among birds of this kind."

Lieut.-Col. W. H. Manning states that in Nyassaland the native name of this bird is "Kilanganjuna" (*The Ibis*, 1901, p. 593).

Mr. F. J. Jackson, who met with it in the Toro forest during a journey to the Ruwenzori range, says (*The Ibis*, 1906, p. 508): "Iris light greyish-green; bare skin round eye lemon-yellow, suffused with pink; bill light brown; feet lemon-yellow.

"Fairly common in the forest."

It will be seen that here again the colouring of the soft parts varies with locality, showing the initial steps towards a sub-division of the species.

The first example of this bird to reach the London Zoological Society's Gardens was purchased in 1864; the Amsterdam Gardens received a pair in 1891; and Russ tells us that during recent years a fair number has been imported into the German market.

White-crowned Pigeon (*Columba leucocephala*).

The adult male is chiefly leaden-grey, deeper above than below; the crown white, bordered behind with grey; the nape deep maroon; behind this a bronze-green mantle, each feather of which has a velvet black border, extending on to the sides of the neck; back faintly glossed with blue; quills and tail-feathers slaty-black, the former with linear whitish margins; bill dull greenish-white, with carmine cere; feet dull red, with carmine scales; naked skin round eyes powdered with white, eyelids with red edges; iris pale buffish-white.

The female is smaller and duller than the male, the crown of the head greyish; and the young are greyish-brown, with whitish foreheads and brown iris, according to Gundlach. Hab., Southern North America and the West Indies.

In Cuba it is a very common resident species, occurring in all the forests throughout the year, but when the berries are ripe which form its favourite food immense flocks collect to devour them.

Being eminently gregarious, considerable numbers nest on the same tree; nidification appears to take place in May or June, according to the habitat in which this species may be observed, and by July the woods abound with the young birds. As usual, the eggs are two in number, and pure white. The call of the bird is described as *tuhu-tu-tutu*.

In the Bahamas Mr. J. L. Bonhote found this pigeon "very abundant at certain seasons, especially during July and August; they were to be found only in the pine woods far from the setlements" (*The Ibis*, 1899, p. 517).

In *The Ibis* for 1903, p. 298, he says: "A resident, not very numerous during the winter. It breeds in large numbers in some of the outlying cays, flying ten or twenty miles to the mainland for its food. The breeding season is late, not commencing till June."

Writing respecting birds collected in the Swan Islands, Caribbean Sea (*The Ibis*, 1909, p. 332), Mr. P. R. Lowe says: "This is a common and well-established species. It breeds on both islands, and is not nearly so shy as such pigeons usually are. On the eastern island it is, in fact, almost confiding, and I shot six or seven specimens with a small collecting gun in less than half an hour.

"Colours of soft parts in the fresh state: Iris white or creamy-white; *Circumorbital bare space* white on a pinkish background, which here and there shows through the white; *base of mandible and maxilla* dull crimson-lake, dull crimson, or dark brownish-purple, according to age; *tip of bill* pale greenish-white, horny-white, or pearly-green; *feet and tarsi* bright crimson, claws brown."

Gosse states that "incubation takes place chiefly in the months of June and July. In Bluefields morass many nests are found on the tallest black mangroves, and are much robbed by the negro youths, who rear the young for sale, the native pigeons being, more than any other birds, kept in cages by the creoles. The nest is merely a very slight platform of dry twigs, rudely attached, on which two eggs are laid" ("Birds of Jamaica," p. 301).

The London Zoological Society first acquired this pigeon in 1865, and in 1866 two pairs were added by presentation and bred one young one the same year; in 1867 a second example was bred in July, two in August, and one in December. The species has been continually on exhibition ever since, four examples having been added as lately as 1904.

Mr. Seth-Smith bred this species in his aviaries in 1902 (see *The Avicultural Magazine*, First Series, Vol. VIII., pp. 287-289, with illustration).

Porto Rico Pigeon (*Columba squamosa*).

The prevailing colour of the adult male is leaden-grey, very slightly paler below than above; but the head, neck and throat are wine-reddish; the nape and a cape which extends over the sides of the neck, metallic violet, each feather bordered with velvety maroon; the flights have narrow pale margins and the tail is dark slate-coloured; bill crimson-lake, tipped with yellowish-white; feet lake-red; skin round eyes dull red dusted with yellow; iris with an inner scarlet ring and a narrower outer yellow one. The female is a little smaller and duller than the male, and the young are brown, with reddish-chestnut tip to the feathers. Hab., on many of the West Indian Islands, but not Jamaica or Bahamas.

This is said to be essentially an arboreal species,

never visiting the earth; this, however, I should regard as rather an extreme statement. The same author, after observing that it is "almost wholly confined to the high forest," continues: "Although in the month of September, if certain berries are ripe, it may also be found upon open places in the vicinity of the forest."* It is inconceivable that any number of pigeons in a clearing would never alight on the earth.

Mr. M. J. Nicoll says (*The Ibis*, 1904, p. 566):—"This fine Pigeon is abundant in the high woods of Grenada. I obtained three examples at Grand Etang. They feed on the large date-shaped seeds of a palm. They are exceedingly wary. I was told that during the eruption of the Soufrière at St. Vincent, enormous flocks of these Pigeons arrived at Grenada and stopped for some weeks, and then disappeared. The note of this species is a harsh 'coo.'"

Two examples of this species were purchased by the London Zoological Society in 1868; four were deposited at the Gardens in 1870, six were purchased in 1873, and one in 1875; in the two succeeding years it was bred at the Gardens; subsequently other specimens were presented and purchased, and in 1886 it was again bred. According to Russ it is rare in the German market.

Specious Pigeon (*Columba speciosa*).

Back, rump, and lesser upper wing-coverts maroon tinged with purple; neck-feathers with regular dark metallic green borders, more or less shot with violet; those of the upper part with sub-terminal white spots, but the feathers of the lower neck without spots and chestnut in the middle; flights brown, the primaries with narrow paler margins; longer upper tail-coverts brown; tail brownish-black; head vinous chestnut; breast dull vinaceous with darker edges to the feathers; middle of abdomen, vent, and under tail-coverts white, with dusky edges to the feathers; under wing-coverts greyish-brown, with a more or less vinous tinge; bill and feet yellowish; irides dark brown. Female duller in colouring, the maroon of the upper parts replaced by brown. Hab., "Mexico and through Central America to Colombia, Guiana, Brazil, and Peru" (Salvadori).

Mr. W. A. Forbes speaks of this as one of the species which abounds in the forests of North-Eastern Brazil when the fruits are ripe; their native name is "Gallegas" (cf. *The Ibis*, 1881, p. 318).

The first example of this pigeon exhibited at Regent's Park was purchased in 1868, a second was added in 1871, and five others in 1876; others have been purchased subsequently. The Amsterdam Gardens secured it in 1885; but, according to Russ (1889) hitherto these are the only Zoological Gardens which have possessed it.

Cuban Pigeon (*Columba inornata*).

Upper back, scapulars, lesser and greater wing-coverts and inner secondaries brownish-grey; median coverts washed with chestnut; anterior and greater coverts with well-defined white borders; primaries greyish-brown, with narrow pale edges to outer webs; lower back, rump, and upper tail-coverts leaden grey; tail dark leaden-grey, rounded; head, neck, and under surface vinaceous purple, the chin more or less whitish; sides, under surface of wings, and under tail-coverts leaden grey; bill black or horn-coloured; feet carmine-red; irides with a leaden grey inner ring, a brownish central ring, and an ochre-yellow outer ring; edges of eyelids and naked orbital skin carmine-red. Female rather smaller and duller. Hab., Greater Antilles.

Gundlach found the nest of this pigeon in May. As usual it was built in a tree, constructed of twigs, and contained two white eggs.

In his "Field Notes on the Birds of San Domingo" (*The Ibis*, 1897, pp. 336, 337), Dr. C. Christy says:—"At the head of Samaná Bay there are well-recognised Pigeon months, June, July and August, and during these months the natives make almost daily excursions from Sanchez to the mangrove-swamps, where the Pigeons are in tens of thousands. They load and fire as fast as their antiquated muzzle-loading appliances will permit, and come home sometimes with their boat literally laden with Pigeons, which they sell for 10 cents per couple. These are delicious eating at this season if properly cooked.

"I made several excursions into the swamp after Pigeons, and one day, June 25, I shot as many as 120, mostly on the wing, in about three hours. It is only necessary to put on a pair of waders or top-boots and take one's stand in the best open space one can find among the tallest mangrove trees. After a dozen or so have fallen, some shot as they fly over and others as they settle for a moment on the tops of the trees, the most difficult work of the day begins, that of wading round to look for them. Unless a native is employed to retrieve them, one has to climb through the network of wet and slippery aerial mangrove-roots, sometimes sinking into the black mud and water up to one's middle, while legions of small crabs, and some big ones with legs a foot long, recede and disappear behind each root or up each stem as one approaches, to say nothing of the clouds of sandflies and mosquitoes.

"When all that can be found are picked up, one returns to one's post, and the shooting goes on once more, till sufficient are shot again to make it worth while to collect them."

Two specimens of this species were purchased for the London Zoological Gardens in 1868, but it is probable that its very abundance is the cause of its rarity in the market, it being thought that so common a bird is hardly worth the trouble of capturing.

Gosse, who confounded this with the next species, says ("Birds of Jamaica," pp. 296-298):—"The Blue Pigeon is found both on the mountains and in the low-lands. On the former it seems less to affect the deep forest than such woods as skirt cultivated ground. When the purple berries of the *phytolacca* are ripe, about the end of the year, these pigeons flock in considerable numbers to feed at dawn and at evening. About the same time they are numerous in the lowlands, for I have found them plentiful in the large morass that extends along the shore from Crabpond to Parker's Bay. They were flying about in pairs for the most part among the black mangrove trees, on whose seeds they were probably feeding. But I found in the stomachs of those which I shot the white blossoms of a species of mistletoe which is abundant there, and in one the bean-like seeds of, as I believe, the madjo-bitter (*Picramnia*). Early in February I visited the mangrove woods of Mount Edgecumbe morass to seek these birds. They were rather numerous, but alighted only on the summits of the tallest trees. Finding that they were very shy, I seated myself, and remained quietly watching. Thus I obtained several successive shots, as they appeared to come round to the spot periodically, perhaps once in half an hour. Two or three were in company, and as they flew from tree-top to tree-top their movements were announced by a

* I quote this from Russ, so that the actual words, though not the sense, may differ slightly from the original.

guttural *jug, jug,* and by the loud rushing of their powerful wings. Frequently one would chase another round the trees, playfully, which I conjectured to be a symptom of pairing.

"The common note of the Blue Pigeon resembles somewhat the barking of a cur; *bow-bow-bōw* the last syllable protracted and falling."

"About the end of April I was informed of a Blue Pigeon's nest on a lofty limb of an inaccessible cotton tree. It was a more substantial structure than those of its congeners, being made of dried grass, or similar material, as well as twigs. A Baldpate had a nest on a contiguous tree, and the neighbouring birds were continually squabbling. I have never seen the eggs."

Rufous Pigeon (*Columba rufina*).

Back, scapulars, lesser and median wing-coverts, chestnut purple with a tinge of lilacine; lower back, rump, and upper tail-coverts leaden-grey; greater wing-coverts brownish-grey; flights brown with narrow paler edges; tail brownish-grey, with terminal sordid grey band; forehead, crown, front of neck, and breast purplish vinous, tinged with lilacine; back of head and upper nape metallic bronze-green, shot with gold and purple; cheeks grey; chin and throat whitish-grey; the vinaceous purple of the breast shading into grey on the sides, abdomen, and under tail-coverts; under wing-coverts also grey; tail below paler than above; bill blackish; feet dark red; irides red. Female rather duller; the chestnut of the upper surface more restricted on back and upper wing-coverts. Hab., Guatemala to Colombia, Guiana, Brazil, Ecuador, and Peru.

Mr. W. A. Forbes, speaking of this species in North-eastern Brazil (*The Ibis*, 1881, p. 386), says: "I obtained a single living specimen of this pigeon at Parahyba, where I was told that at some seasons of the year, when certain fruits were ripe, it was common in the forests around. The Brazilians know it as the 'Gallega.'"

Mr. W. L. S. Loat, speaking of it as observed in British Guiana, says (*The Ibis*, 1898, p. 566): "The wild fruits attract the Common Pigeon (*Columba rufina*) sometimes in great numbers; they are generally fat, and make very good eating."

Two specimens of this species were purchased by the London Zoological Society in 1867, and in 1880 it was again received: the German chemist, Landauer, possessed it in 1882.

Ring-tailed Pigeon (*Columba caribæa*).

Upper surface grey, slightly tinged with olivaceous; primary-coverts black, partly edged with whitish; primaries black; tail dull grey, banded towards the middle with black; back of neck metallic green, shot with purple; head, sides of neck and under surface vinous; under tail-coverts sordid whitish-grey; wing below grey, darker on the flights; tail below dusky grey, with a broad, paler, terminal belt; bill black; feet probably red; irides varying from reddish orange to deep vermilion. Female rather smaller, and more smoky in all its tints than the male; sometimes, if not always, more gravel-reddish on under surface. Hab., Jamaica and Porto Rico.

Gosse says ("Birds of Jamaica," pp. 291-295): "Of all our Doves, none is so exclusively arboreal as this; he is never seen to put his feet upon the earth. Though it is probable that he must occasionally procure gravel to aid in the comminution of his hard food, and that when the resources of the wild pines are exhausted in the long droughts, he must descend to drink at the mountain ponds, or gully springs, it seems that he cautiously selects his occasion, when unwitnessed by human eyes. And yet it is said not to be a shy bird, nor, at certain times, difficult to obtain by those who have made themselves acquainted with its habits. It inhabits the most recluse and dense mountain forests, where few are able to follow it but the negro fowlers. The penetration of steep mountain woods, abounding in prickly bushes, and tangled beyond all description by twining and pendent lianes, many of which are formidably spinous, where there is nothing like a pathway, and the ground is strewn with enormous masses of honey-combed limestone, over whose sharp points the hunter must often climb at the risk of his neck, or with a loose rubble that slips from beneath the feet and causes continual falls, is an enterprise that demands no small degree of courage, temper, and perseverance. The naked feet of the negroes catch hold of the rocky projections, almost like the hind hands of the monkey, and they can proceed with rapid and noiseless step; while the shoes of the white man, in his slow and painful progress, betray by the displacing of stones and the crackling of twigs his approach to the wary bird while yet far away. The mosquitoes also that, thirsting for blood and swarming in such situations, dance around his face with their maddening hum, and soon inflame head, hand, and foot with their pungent stings, make a tyro long to be out again almost before he has lost sight of the open sky of the clearing. But it is the presence of these most annoying insects which affords an opportunity of obtaining the highly-prized Ring-tail. This bird appears to suffer more from their stings than others, or else its superior sagacity has taught it a resource of which others are ignorant or unwilling to avail themselves. It is aware that these little insect pests cannot abide smoke, and wherever the blue clouds curl gracefully through the tall trees from the woodman's fire the Ring-tail is said to resort thither, if within the neighbourhood, and solace itself with a temporary suspension of insect assaults. But, alas! it is only to expose itself to a more fatal peril, for the negro sportsmen have marked the habit and fail not to take advantage of it. Whenever they have noticed the birds feeding on the berries of any particular tree, they take an early opportunity of kindling a fire beneath it, near which they conceal themselves, so as to watch the tree. The birds begin to arrive and are shot down by the fowler one after another, the repeated flashes and reports and the falls of their companions driving the survivors away for a few moments only from the attractive spot, to which they again and again return till the gunner's ambition is satisfied."

"The Ring-tail is stated invariably to perch near the middle of a tree, usually in the fork of the principal limbs; where when seated, it will remain quietly looking down at the fowler, perhaps within a few yards of his head. The centre of those trees which are clothed with a dense, tangled mass of withes or creepers, is preferred; and it is asserted that on no occasion is this bird to be seen perched on an exterior twig or branch."

"The Ring-tail will sometimes leave his solitudes and come down to eat the berries of mistletoe growing on sour-sop and other trees. A friend has seen four thus engaged on a tree in the house-yard. It eats the seed of the yam, also in the provision ground."

"Robinson found in one the hard, perforated seeds of the small palmetto-thatch. He mentions also that in the autumn they owe their fatness to feeding on the fruit of the trumpet-tree, wild raspberries, and wild star-apples."

Difficult as it would seem to be to obtain this pigeon, it has been exhibited at the London Zoological Gardens. Russ, however, does not mention it in his "Fremdländischen Stubenvögel."

Banded Pigeon (*Columba fasciata*).

Upper surface grey, brownish on the upper back and lesser wing-coverts, otherwise bluish; flights brown, with narrow whitish margins; the greater upper wing-coverts also with whitish outer margins; tail above grey at base, crossed at the middle by a narrow black band and powdery whitish-grey at extremity; a narrow white half-collar on the nape; hind neck metallic golden green; head, sides of neck, throat, and breast purplish-violet; sides pale grey; middle of abdomen and under tail-coverts white; tail below paler than above; bill yellow with black tip; feet yellow; irides carmine, edged with gold. Female smaller and duller, the head and under surface redder, less vinous. Hab., Western United States, from Washington Territory and New Mexico southward to Guatemala and Nicaragua.

I quote the following from Major Bendire's "Life Histories of North American Birds," Vol. I., p. 123: "'Mr. O. B. Johnson, in his 'List of the Birds of the Willamette Valley, Oregon,' states: 'An abundant summer resident, feeding chiefly on berries. They nest in various situations, much like the common Dove, *Z. carolinensis*. I found one of leaves and moss beside a tree, placed on the ground between two roots; another one upon an old stump that had been split and broken about 8 ft. from the ground. Another was in the top of a fir (*A. grandis*), and was built of twigs laid upon the dense, flat limb of the tree, about 180 ft. from the ground. These each had two eggs, pure white, and elliptical, differing from those of *Z. carolinensis* only in size, a set before me measuring 1.60 by 1.20, and 1.55 by 1.19 inches.'"

According to Mr. Poling, quoted by the same author, this species appears to nest at all seasons, to sit very closely, and even, when disturbed, to carry off the egg from the nest (sometimes only one egg is deposited) in the feathers of the belly, in which position it is held by the legs. This seems a very extraordinary proceeding, but it is based upon several observations made by Mr. Poling.

Major Bendire says (p. 127): "The egg of the Band-tailed Pigeon is large for the size of the bird, and is somewhat peculiar in shape. This may be called a pointed elliptical ovate. All the eggs I have seen show this feature. They are pure white in colour, the shell is close grained, smooth, and slightly glossy."

I have included this species in "How to Sex Cage-Birds," and therefore must have had some evidence of its importation, but when it came to hand or who received it I cannot now discover, having omitted to note the facts (as I usually do) in my copy of the "Catalogue of Birds."

White-naped Pigeon (*Columba albilinea*).

Back and wings slate-coloured, slightly glossed with olive-green; rump and upper tail-coverts bluer and paler; flights brownish-black, the outer primaries with narrow, whitish edges; tail slate-grey at base; with an indistinct blackish band across the middle, terminal extremity dull grey; hind neck dark metallic green shot with gold; crown deep vinaceous purple; a whitish band on the nape; throat slate-grey; rest of under-surface purplish-vinaceous, with the sides, under wing-coverts and under tail-coverts leaden grey, the last-mentioned washed with vinous; tail below paler than above; bill and feet yellow; irides red with an inner whitish ring. Female probably duller than the male. Hab., "Columbia, British Guiana, Ecuador, Peru, and Bolivia." (Salvadori.)

According to T. K. Salmon ("Proceedings of the Zoological Society," 1879, p. 543), this species "makes a nest of sticks and twigs in high underwood in forest."

Taczanowski ("Ornithologie du Pérou," Vol. III., p. 233) says: "The egg, received from Chirimoto, in February, shows the following dimensions: 39.3 millimetres in length by 29 in diameter." He quotes the following note by Stolzmann: "This pigeon is distributed in the sierra of northern Peru between the limits of 5,000 and 10,000 feet. It is not rare at Cuteroo and at Huayabamba, in the thickets near to the cultivated fields or the young forest. I have often eaten the flesh of this species, but it has an unpleasant taste, and is of a dark brownish violet colour. It is known by the name *panicunga* (*pano* = cravat in Spanish, *cunga* = neck, in Quichua), taken from the white band resembling a cravat," and the following by Jelsky: "During a certain time this pigeon sustains itself on the seeds of a certain bush of *Solanum*, at other seasons of different fruits of trees and shrubs. It allows itself to be approached easily when it is not disturbed, but it becomes wild at the first shot of a gun, and is always ready to profit by a lesson. They perch in company on dry trees, sleep towards noon, some of them so soundly that they are none the wiser, or at any rate pay no attention to the sound produced by the hunter approaching through the bushes. Usually they do not all fly off together; some wait a considerable time, the others go from the opposite side."

A specimen of this pretty pigeon was purchased by the London Zoological Society in 1851.

Araucanian Pigeon (*Columba araucana*).

Upper back and scapulars vinaceous-chestnut; lower back, rump, and basal upper tail-coverts leaden-grey, longer tail-coverts brownish-grey; upper wing-coverts greyish-brown, paler on the outer and greater ones; flights brownish-black, with narrow whitish edges; tail above dull grey, with a subterminal black band; a whitish band on the nape; hind neck metallic bronze-green; head and under surface vinaceous chestnut, washed with lilacine on the breast; under tail-coverts leaden-grey, with a purplish or rufous tinge; under wing-coverts and sides leaden-grey; bill black; feet rose-red; irides reddish-yellow. Female smaller, the bill more slender when seen in profile. Hab., Chili and Straits of Magellan.

This species is said to be extremely abundant on the wooded banks of rivers in Chili. Mr. Ambrose A. Lane says (*The Ibis*, 1897, p. 297): "I did not see much of this species in Central Chili, though I observed it once in a wooded and secluded glade on the hills near Hospital, where I was told a pair nested. The birds were said to come in flocks there in the cold season. In the south I found them plentiful, especially about Valdivia and Rio Bueno. In Arauco they are fairly numerous, but not so much so as in the former places. They probably extend far south.

"These Pigeons nest at Rio Bueno about December. The nest is a loose structure of sticks, like that of the Queest; and one I got was in the fork of a tree about 15 feet high. Their cooing was a deep booming sound.

"They are generally known as the 'Torcaza.'

"The iris of this Pigeon is a double ring, the outer section being cadmium-yellow, and the inner orpiment-orange. The bare skin round the eye is Indian purple, marked with a delicate network of pomegranate-purple. The tarsi and feet are of a brilliant poppy-red, the bill and claws black."

In spite of the abundance of this species in the south

of Chili, no effort seems to be made to import it. One specimen, presented by the late Lord Lilford to the London Zoological Society, appears to be all hitherto recorded.

Canarian Pigeon (*Columba laurivora*).

Prevailing colour, grey; the head and nape glossed with green; the front of mantle and under parts with metallic magenta margins to the feathers; back, rump, and upper tail-coverts leaden-grey; wings brown, the outer webs of the primaries with pale edges; outer tail feathers with a paler terminal belt; under tail-coverts dull grey, the basal ones tinged with vinous; tail below grey at base gradually getting paler to the extremity; bill white, the nostrils pink, pale rose at tip; feet lake red; iris orange, with outer red ring. Female much smaller, and with more prismatic rosy-lilac on the back. Hab., Canary Islands—"Gomera and Palma" (Salvadori).

Mr. E. G. B. Meade-Waldo, writing about a visit to Gomera (*The Ibis*, 1889, pp. 7, 8), says: "On the Cordillera, which was very steep indeed, and covered with thick heath and laurel-scrub, and with many precipices, the whole descending into the valley by a series of terraces, I found *C. laurivora* fairly abundant, flying along the face of the mountain in pairs and singly. Their light-tipped tails were very conspicuous, and looked white when flying, giving them somewhat the appearance of gigantic Turtle-Doves. Their flight was peculiar, quite unlike that of any Pigeon I had ever seen, a soft flopping flight, fairly fast. I found it exceedingly difficult to get good specimens, as, if shot when flying along the mountain-side, the birds were mostly dashed to pieces by a fall of over 100 feet into the scrub; but I eventually found a place in a barranco where they used to settle in some tall trees, and there I managed to get some very good birds. They varied very much in size, my finest cock being 17½ inches, while some were only 15 inches in length. I had on this and subsequent days many opportunities of watching them. They are very active on the ground, on which a great deal of their time appears to be spent, as one might gather from their strong, muscular thighs and legs. I only heard one bird 'coo,' and none of those I shot proved to be nesting."

"Three months later, May 6th, I went again to Gomera, my object this time being to get, if possible, some young *C. laurivora* alive. Canon Tristram accompanied me on this occasion. We found the Pigeons had only just begun to breed; some had laid, and others were going to do so. I had, however, one dead young one brought to me. One egg only is laid. In the crops of some shot were the blossoms of flax and a little barley; the Pigeons came down into the barley regularly to feed."

Describing a visit to Palma (t.c. pp. 509, 510), the same writer observes: "*C. laurivora* has much the same habits as in Gomera, but is scarcer and more distributed; it keeps to the almost perpendicular slopes covered with scrub, and it is especially fond of the ledges in the steep sides of the barrancos, where ferns grow. On these ledges it nests; it was, however, only just thinking of breeding in the end of April. The native sportsmen say that when the cherries are ripe the 'Rabiles' come down to them, and that then they shoot numbers. This Pigeon has a very peculiar walk, marching along with a long, swinging gait, raising its tail and bowing its head at every step; it can, however, run quickly, like a Partridge. A fine old male in my aviary has given me many opportunities of studying its actions, and I have had many wild birds walking about quite close to me. My bird was secured with a shot in his head and another in his intestines, from both of which he quickly recovered, but remained almost senseless, and had to be crammed for three weeks; he is now in perfect health, and fairly tame, but won't touch his natural food, and prefers wheat and hempseed to anything; he eats large quantities of green rape. The principal food of these Pigeons in La Palma is the fruit of the til-tree and the viñatigo."

Mr. St. Quintin published an account of the breeding of this species in his aviaries in *The Avicultural Magazine*, First Series, Vol. V., p. 74. I believe Mr. Meade-Waldo turned loose some specimens in the Kentish woods, and that they bid fair to establish themselves. It is to be hoped that they have done so, for our fauna will bear a good deal of improvement, and so long as the introductions are recorded I can see no possible objection to the addition of many beautiful creatures to the British collection.

An example of this species was deposited at the Regent's Park Gardens in 1892.

Bolle's Pigeon (*Columba bollii*).

Slate-blue, back and sides of neck glossed with green and purple; a patch at side of neck glossed with coppery-reddish; mantle glossed with purple in front and with dull green behind; flights and primary-coverts dead black; tail slaty-black, crossed by a broad subterminal dark grey belt; breast and abdomen rich vinous; vent, flanks and under tail-coverts slate-blue; bill red, with darker tip; feet coral-red; irides straw-yellow edged outside with coral-red. Female smaller, and considerably duller; the prismatic colours at back of neck less pronounced; the hinder abdomen more ashy. Hab., "Canary Islands—Teneriffe, Gomera, Palma" (Salvadori), "Gran Canaria" (Tristram).

Writing about a visit to Gomera (*The Ibis*, 1889, p. 6), Mr. Meade-Waldo says: "*C. bollii* was common enough, and I shot two or three for specimens, finding some of its nests, each containing one egg, and catching alive a nearly full-grown young one, a fine male, which I have at the present time."

Of his visit to Palma (t.c., p. 510), he says: "I heard and saw plenty of *Columba bollii*; they frequented the higher mountains, as in Gomera, and the larger tracts of forest. I shot two fine males, just to identify them for certain, as a man told us they had a ring round their necks; he meant the copper-coloured feathers on each side of the neck." The same writer (*The Ibis*, 1893, p. 200) says: "This laurel-loving Pigeon inhabits all the suitable grounds in the islands of Teneriffe, Gomera, La Palma, and Gran Canaria, in which island, however, Canon Tristram reports it to be very scarce, owing to the almost complete destruction of the old laurel forests. In Teneriffe, ever since we went there, in 1887, it has become very rare in the neighbourhood of Orotava and Santa Ursula. In La Palma and Gomera it appeared to be fairly abundant. It lays but one egg, and breeds all the year round, but principally in winter and early spring." Five examples of this Pigeon were deposited at the Gardens at Regent's Park in 1888, and the same year one young one was reared; a second was reared in 1889, shortly after which two more examples were deposited at the same Gardens.

Madeiran Pigeon (*Columba trocaz*).

Slate-blue, rather paler on the head, fore neck, lower back, rump, and under-surface; upper mantle glossed with green and purple; primary-coverts and flights slaty-black, the primaries with narrow pale grey edges; tail dark leaden grey, crossed beyond the middle by a

grey belt; feathers of back and sides of neck tipped with silvery-grey, those at back of neck glossed with green; breast vinous-red; bill and naked orbital region coral-red, the former with blackish tip; feet coral-red; irides straw-yellow. Female distinctly duller than the male, with less prismatic green on back of neck and the abdomen bluer. Hab., Madeira.

Mr. W. R. Ogilvie Grant shot eight specimens of this species during a visit which he paid to Madeira in 1890 (*vide The Ibis*, 1890, p. 442). He says it "is still fairly common in the north of the island."

I have not come across any notes relating to the wild life, but doubtless, like *C. laurivora* and *C. bollii*, it lays only one egg.

Three examples of this species were deposited at the London Zoological Society's Gardens in June and September, 1891.

White-throated Violet Pigeon (*Columba albigularis*).

Blackish slate colour; feathers of crown, neck, back, rump, and under surface edged with metallic purple varying to green; edges of upper wing-coverts and longer upper tail-coverts narrower and greener; flights and tail slaty-black; cheeks and throat white; bill red with white tip; feet dull coral-red, with pale claws; irides ochreous-orange; orbits red. Female probably smaller and duller. Hab., "From the Halmahera and Amboyna groups through the Papuan Islands to the Louisiades." (Salvadori.)

I have found no notes on the wild life of this pigeon; but Herr A. E. Blaauw, who possessed several examples early in 1880, says that "the behaviour of this pigeon is a very quiet one; it moves rarely and rather awkwardly on the ground, and is decidedly an arboreal bird. I have never heard it utter a note. It is a pity that it is so rare, for it is not at all dangerous to other pigeons, or other birds generally, and even sitting quietly is a remarkable ornament in the aviary."

This species reached the Amsterdam Zoological Gardens, in 1875, and although Russ states that beyond this importation and those possessed by Blaauw, it has certainly not been brought home alive, he overlooks the fact that the London Zoological Society received it in March, 1874, and recorded it in the "List of Animals" under the name of *Ianthœnas leucolœma* (a species not noted in the "Fremdländischen Stubenvögel"). In 1908 six examples were deposited at our Gardens.

Vinaceous Pigeon (*Columba plumbea*).

In the adult male the head, neck, and under surface are purplish-vinous; the back, rump, upper tail-coverts, tail, and upper wing-coverts dark brown, glossed with olive and showing more or less defined purple reflections; flights having the inner webs sometimes tinged with ruddy-brown; under wing-coverts deep greyish-vinous; bill black; feet dark-red tinged with violet; iris deep vinous-red.

The female is duller, less vinous on the under parts, and often with reddish spots on the nape. The young have narrow rufous edges to the feathers of the head, wing-coverts, and under parts. Hab., "Cayenne, British Guiana, Colombia, Ecuador, N. and E. Peru, Bolivia, and Brazil." (Salvadori).

Burmeister says that this bird was very abundant in New Freiburg when he was there. It is strictly a wood pigeon, and rarely leaves the shelter of the woods and dense scrub. Although Burmeister believed the *C. vinacea* of Temminck and *C. plumbea* of Vieillot to be distinct species, Count Salvadori regards them as synonymous.

According to T. K. Salmon ("Proceedings of the Zoological Society," 1879, p. 543) the food of this bird consists of fruit.

Tschudi says (*Vide* Taczanowski, "Ornithologie du Pérou," Vol. III., p. 235) that it inhabits the forest region of Eastern Peru.

Dr. E. A. Goeldi, who obtained examples of this pigeon during an expedition up the Capim River, says (*The Ibis*, 1903, p. 481) that it is "here called 'Pomba gallega.'"

Russ tells us that the chemist Landauer possessed this species alive, and considered it very delicate; which does not seem very probable. The Zoological Society of London purchased two examples in 1870, one in 1877, and one in 1895; but Russ does not refer to any of these.

Mayer's Pigeon (*Nesœnas mayeri*).

Head, neck, mantle, and under surface pale pink, fading to whitish towards the forehead, cheeks, and upper throat, and deepening in tint on the mantle; remainder of upper back and wings brown, slightly shaded with olive and rufous; lower back and rump greyish, the latter mottled with chestnut; upper tail-coverts and tail cinnamon, the outer tail feathers fading to buff on outer webs and towards the tips; under surface of wings ashy-brown, rather paler on axillaries and under wing-coverts; bill yellow, reddish towards the base; feet red; irides yellow. Female not differentiated. Hab., Mauritius.

I have not come across any field notes relating to this species. Two examples were presented to the London Zoological Society, by Lieutenant-Colonel Neville Manders, in October, 1906, and Mr. T. H. Newman, who very kindly sent me a list of *Columbæ* not included in "How to Sex Cage-Birds," tells me that other specimens have since been added to the collection at Regent's Park.

This species completes the *Columbinæ* (the first subfamily of the *Columbidæ*. We now pass on to the *Macropygiinæ*, which are large pigeons, running to from 14½ in. to 17 in. in length.

Narrow-barred Pigeon (*Macropygia leptogrammica*).

Back, rump, wings, upper wing- and tail-coverts irregularly barred with black and chestnut; flights brown; four central tail feathers barred with black and vinous-chestnut; third pair of feathers brown, broadly belted with slate-grey about the middle, and narrowly barred with blackish towards tip and at base of outer web; three outer pairs slate-grey, with a broad black belt; the outermost with a chestnut spot on inner web; forehead, chin, and throat vinaceous-buff; crown, back of head, nape, sides of neck, and mantle shining metallic-green, with purple or bronze reflections, the nape sometimes purple, with green reflections; lower throat and breast greyish-vinous, the former with bronzy reflections; flanks and axillaries vinous slaty-grey; abdomen buff, frequently shading into cinnamon-rufous on under tail-coverts; bill black; feet red; irides very narrow, yellow; eyelids red. Female much more rufous on under surface; the head, neck, and mantle barred with black and chestnut, like the rest of the upper surface, the head slightly purplish; the feathers of neck, mantle, and breast with transverse golden-brown bars and metallic-green tips, shot with purple. Hab., "Hills of Java and Sumatra up to 7,500 feet, and the Malay Peninsula." (Salvadori.)

I have found no field notes relating to this pigeon; but Jerdon says of its larger and rather more brightly-

coloured Indian representative ("Birds of India," Vol. III., p. 474) that it "is found singly, occasionally in small parties; feeds on various fruits, which it chiefly takes from the trees, now and then descending to the ground. Its voice is a deep, repeated *coo*. I found its nest on the Khasia Hills at about 4,500 feet on trees, at a moderate elevation."

Russ evidently regards this and the Indian *M. tusalia* as one species, and he considers it of no interest for aviculture, because, he says, it has only existed in the London Zoological Gardens, where, however, one example was exhibited in 1876 and two in 1892, but under the incorrect locality of "Celebes"!

EMILIAN PIGEON (*Macropygia emiliana*).

Back, rump, wings, and tail deep chestnut, faintly tinged with purplish; flights brown, their inner webs broadly cinnamon; tail conspicuously rufescent, the three outer pairs of feathers bright rufous, with a broad black belt extending towards the base of the inner web; head, neck, and under surface cinnamon-rufous; the hind neck and upper mantle with a lilacine lustre, the latter finely freckled with brown; bill horny or flesh-coloured; feet red or purplish; irides pearly, or red with a yellow inner ring. Female without lilacine lustre on upper surface, and more or less barred, especially on the nape and mantle, which are bright cinnamon; below cinnamon with transverse dusky bars on the lower throat and breast according to a specimen sexed by Wallace. I found the following differences in undoubted females:—The mantle crossed by dusky-bordered cinnamon bars; throat paler; breast broader, with dusky margins to the feathers in front. Hab., Java, Lombock, and N. Borneo.

According to Mr. J. Whitehead (*The Ibis*, 1898, p. 233), this species nests in open localities in dead bracken only a foot or two above the ground, its plumage assimilating perfectly with the dead fern.

An example of this pigeon was purchased by the London Zoological Society in 1866.

PHEASANT-TAILED PIGEON (*Macropygia phasianella*).

Chestnut-brown; flights brown; tail reddish-brown, the three outer feathers brighter reddish, especially on the inner webs, the outermost also on the outer web; all three with a broad black belt extending towards base of inner web; forehead and throat paler chestnut; back of head and hind neck metallic lilacine shot with green; lower throat tinged with vinaceous and narrowly barred with blackish; under wing-coverts, axillaries, and inner margins of primaries reddish-cinnamon; bill dark olive-brown, mealy at base; feet pinkish-red; irides blue with an outer circle of scarlet; orbits mealy bluish-lilac. Female chestnut-brown, the upper part of head much redder, as well as the edges of the upper wing-coverts; sides of head and neck rufous barred with brown; under surface finely freckled with dark brown. Hab., "Australia, from Cape York to Victoria and S. Australia." (Salvadori.)

Gould says ("Handbook," Vol. II., pp. 148, 149): "The interior of the dense brushes are the favourite haunts of this bird, but it occasionally resorts to the crowns of the low hills and the open glades of the forest, where it searches for its food on the ground; on being disturbed it flies to the branches of the nearest tree, spreading out its broad tail at the moment of alighting. From Illawarra to Moreton Bay it is a common and stationary species. It is a fine, showy bird in a state of nature, and exhibits itself to great advantage when it rises from the ground to the trees. While traversing the brushes I frequently saw this bird busily engaged searching on the ground for fallen seeds and berries. Rarely were more than four or five seen at one time, and most frequently it occurred singly or in pairs." "As its lengthened tarsi would lead us to imagine, it spends much of its time on the ground; and when flushed in the depths of the forest it merely flies to the branch of some low tree, and there remains with little appearance of fear.

"Its note is loud, mournful, and monotonous."

A. J. Campbell ("Nests and Eggs of Australian Birds," p. 674) says: "*Nest.*—A primitive structure, being simply a few sticks placed crosswise, without any cavity, and barely sufficient to retain the egg in position. (North.)

"A nest found in the Richmond River district was large for that of a pigeon, being 6 inches across, with a cavity about 1 inch deep, while the whole was 9 inches in depth; but the foundation tapered to a point, making the structure appear like an inverted triangle, which was inserted in the topmost forked branches of a buoyong (*Tarrietia*) sapling, at a height of about 30 feet from the ground.

"*Eggs.*—Clutch, one to two; elliptical in shape, sharply nipped off at one end; texture of shell fine and brittle; surface glossy; colour white, with a faint creamy tone. Dimensions in inches of single examples (1) 1.36 × .96, (2) 1.33 × .96, (3) 1.38 × .97."

Mr. Campbell says that this species feeds on the berries of the common ink-weed, and that the nest is sometimes placed in the centre of a bird's nest fern or the crown of a fern-tree.

The London Zoological Society purchased two examples of this pigeon in 1874; the Amsterdam Gardens possessed it as early as 1856.

DOREY CUCKOO-PIGEON (*Macropygia doreya*).

Above chestnut-brown; nape and upper mantle bright metallic green, more or less shot with purple; three outer tail-feathers cinnamon with a sub-terminal blackish band; head vinous, crown and back of head somewhat greyish; front of head and throat pale rufous; breast rich vinaceous shot with purple, with two blackish bars across each feather, shading into tawny buff on the abdomen and deepening to cinnamon on the vent and under tail-coverts; under wing-coverts, axillaries and tibial feathers chestnut; bill dark; feet red. Female above chestnut-brown, the feathers being brown tipped with chestnut, broadly on the wing-coverts; nape and mantle paler, barred with dark metallic green and rufous; head reddish chestnut; under surface rufous very faintly barred and freckled, especially on the breast, deepening to cinnamon on the flanks, vent, and under tail-coverts. Hab., "New Guinea, with the surrounding North-western Islands—Waigiou, Guebeh, Batanta, Salawatty, Mysol, Mysori, and Jobi, and also Aru Islands." (Salvadori.)

I have found no notes respecting the wild life of this species. Three examples reached the London Zoological Gardens in July, 1908.

The sub-family *Ectopistinæ* contains only a single species.

PASSENGER PIGEON (*Ectopistes migratorius*).

Upper surface bluish-grey, paler on the rump; back and sides of neck metallic golden and lilacine violaceous; scapulars, tertials, and median wing-coverts with about twenty-five velvety black spots; flights brownish-black edged with greyish; the inner primaries grey at the base of outer web; central tail-feathers dark grey, the others pearl grey, with a patch of cinnamon followed by a black spot at base of inner web, their extremities nearly white; chin whitish-grey; throat and breast cinnamon-reddish, changing to pale vinous on sides and abdomen; flanks pale grey; vent and under tail-coverts

white; under wing-coverts bluish-grey; bill black; feet lake-red; irides orange; orbital skin red. Female above mostly pale brown; rump and upper tail-coverts grey; sides of neck metallic lilacine violaceous; median and greater wing-coverts brownish-grey; the median coverts, scapulars and tertials with about fifty-one velvety black spots; flights brown, the inner primaries dull greyish at base of inner web; central tail-feathers browner, otherwise the tail as in the male; throat reddish-white; back of fore neck and breast pale brown, fading into white on the abdomen and under tail-coverts. Hab., "Eastern North America, from Hudson's Bay southward, and westward to the Great Plains, straggling westward to Nevada and Washington Territory. Accidental in Cuba." (Salvadori.)

Major Charles Bendire ("Life Histories of North American Birds," Vol. I., pp. 133-138) says that "the extermination of the Passenger Pigeon has progressed so rapidly during the past twenty years that it looks now as if their total extermination might be accomplished within the present century. The only thing which retards their complete extinction is that it no longer pays to net these birds, they being too scarce for this now, at least in the more settled portions of the country, and also, perhaps, that from constant and unremitting persecution on their breeding grounds they have changed their habits somewhat, the majority no longer breeding in colonies, but scattering over the country and breeding in isolated pairs.

"In order to show . . . the immense destruction of the Passenger Pigeon *in a single year and at one roost* only, I quote the following extract from an interesting article 'On the habits, methods of capture, and nesting of the Wild Pigeon,' with an account of the Michigan nesting of 1878, by Professor H. B. Roney, in the *Chicago Field*, Vol. X., pp. 345-347): 'The nesting area, situated near Petosky, covered something like 100,000 acres of land, and included not less than 150,000 acres within its limits, being in length about 40 miles by 3 to 10 in width. The number of dead birds sent by rail was estimated at 12,500 daily, or 1,500,000 for the summer, besides 80,352 live birds; an equal number was sent by water. We have,' says the writer, 'adding the thousands of dead and wounded ones not secured, and the myriads of squabs left dead in the nest, at the lowest possible estimate a grand total of 1,000,000,000 Pigeons sacrified to Mammon during the nesting of 1878.'

"The last-mentioned figure is undoubtedly far above the actual number killed during that or any other year, but even granting that but a million were killed at this roost, the slaughter is enormous enough, and it is not strange that the number of these Pigeons are now few compared with former years."

When one contemplates such wholesale massacres as the above, one cannot wonder at the stringent laws for the protection of their wild birds that have been enacted in the United States. The author continues: "Mr. Frank J. Thompson, in charge of the Zoological Gardens at Cincinnati, Ohio, gives the following account of the breeding of the Wild Pigeon in confinement: 'During the spring of 1877, the society purchased three pairs of trapped birds, which were placed in one of the outer aviaries. Early in March, 1878, I noticed that they were mating, and procuring some twigs, I wove three rough platforms, and fastened them up in convenient places, at the same time throwing a further supply of building material on the floor. Within twenty-four hours, two of the platforms were selected; the male carrying the material, whilst the female busied herself in placing it. A single egg was soon laid in each nest and incubation commenced. On March 16, there was quite a heavy fall of snow, and on the next morning I was unable to see the birds on their nests on account of the accumulation of the snow piled on the platforms around them. Within a couple of days it had all disappeared, and for the next four or five nights a self-registering thermometer, hanging in the aviary, marked from 14 deg. to 19 deg. In spite of these drawbacks both of the eggs were hatched and the young ones reared. They have since continued to breed regularly, and now I have twenty birds, having lost several eggs from falling through their illy-contrived nests, and one old male.'

"Their food consists of beechnuts, acorns, wild cherries, and berries of various kinds, as well as different kinds of grain. They are said to be very fond of, and feed extensively on, angle worms, vast numbers of which frequently come to the surface after heavy rains, also on hairless caterpillars.

"Their notes during the mating season are said to be a short 'coo-coo,' and the ordinary call note is a 'kee-kee-kee,' the first syllable being louder and the last fainter than the middle one.

"Opinions differ as to the number of broods in a season; while the majority of observers assert that but one, a few others say that two, are usually raised. The eggs vary in number from one to two in a set, and incubation lasts from eighteen to twenty days, both sexes assisting. These eggs are pure white in colour, slightly glossy, and usually elliptical oval in shape; some may be called broad elliptical oval.

"The average measurements of twenty specimens in the U.S. National Museum collection is 37.5 by 26.5 millimetres. The largest egg measures 39.5 by 28.5, the smallest 33.5 by 26 millimetres."

The first example of this species to arrive at the Regent's Park Gardens was a female received in exchange in 1852; this was followed by a male in 1857, and others were added in later years, the last recorded in the ninth edition of the "List of Animals" being three examples presented by F. J. Thompson, Esq. (probably of the Zoological Gardens previously referred to), in 1883.

CHAPTER XVII.

TURTLE-DOVES AND ALLIES

(Peristeridæ).

This family is characterised by the length of the foot proper being equal to, or longer than, the middle toe; the number of tail-feathers ranges from twelve to twenty. Although Count Salvadori classes these birds generally as "Ground Pigeons," very many of them are distinctly more arboreal than terrestrial in their habits. The family is divided into seven sub-families, the distinctnve characters of which appear to me to be for the greater part quite unimportant, being based largely upon coloration; a study of the habits would yield far more reliable differences upon which to base the groups. The sub-families *Zenaidinæ* and *Turturinæ* are so closely related that I do not hesitate to include them in the same chapter.

In their wild state these birds feed upon seeds of weeds, sometimes grain, green shoots, beech-nuts (in some cases small acorns), wild peas, berries, small worms, and smooth caterpillars. In captivity

they do well upon a diet of white millet, dari, a few hempseeds (especially during the moult or when pairing), and an occasional small earthworm. The *Zenaidinæ*), or so-called Ground-Doves, chiefly come to the ground to feed; they have twelve to fourteen tail feathers, the tail is either long and with the feathers graduated, or of moderate length and rounded; some of them have the scapulars and innermost upper wing-coverts spotted with black (*Zenaidura*, *Zenaida*, and *Nesopelia*), others have the two first primaries emarginate towards terminal third of inner web, the tail rather broad, a white patch on the outer upper wing-coverts, and no black spots on the scapulars (*Melopelia*). Take it all round, it is a group which seems to need definition. In many respects the genus *Leptoptila* (family *Peristeridæ*) seems to approach the Turtle-Doves; though perhaps, in spite of its New World origin, it comes nearer to *Turtur* than to *Zenaida*, though I cannot help thinking it would have looked more natural in the *Zenaidinæ* than in the same group with *Phlogœnas*. Happily it is not necessary for me to concern myself with its natural affinities; all I have to do is to follow the more experienced lead of Count Salvadori.

Sub-family Zenaidinæ.

Carolina Dove (*Zenaidura carolinensis*).

Above bluish, but suffused with pale brownish olive, excepting on the top of the head, the outer portion of the wings, and the upper surface of the tail, which is slightly tinged with this colour; wing-coverts and scapulars with, mostly concealed, black spots; tail above blue, with black sub-terminal bars, excepting on the seventh feather; the tips, excepting on the sixth feather, grading from white to pale blue; the sides of head and neck and the under surface generally pale brownish-red, washed with purple on the breast, paler behind and changing to brownish-yellow on the vent, tibiæ, and under tail-coverts; a black dash below the ear-coverts; sides of neck metallic purplish-red; sides of body and wings below pale clear blue; tail feathers below black, with the outer web of the outermost one white, the others with white tips becoming bluer towards the middle feathers, which are brown; bill black; feet lake-red; irides brown; naked orbital skin livid bluish. Female rather smaller, the breast greyish-brown like the back, but paler; head and neck less blue, and not so iridescent. Hab., "North America, from Southern Maine, Southern Canada, and Oregon, south to Panama and the West Indies." (Salvadori.)

Some examples have the sides of the neck more golden than purple.

J. G. Cooper, in his "Ornithology of California," p. 513, says:—"They arrive from the south in large flocks in March and April, and spread over the whole country, even those barren desert mountains towards the Colorado, where scarcely any birds are to be found. I there noticed them in May coming from all directions about sunset to drink at the springs which are scattered at long intervals in that region. From early in April to June their nests and eggs may be found in various situations, on the ground, on fences, stumps, large branches, and among the foliage of trees and bushes. The nest consists of a few twigs carelessly laid together, is about 4.50 inches wide, with scarcely any depression, and so open that the two white eggs may be seen through the bottom. These measure about 1.12 by 0.90 inches."

The London Zoological Society purchased an example of this Dove in 1861, and received two in exchange in 1886.

Martinican Dove (*Zenaida auritæ*.)

The male is brown above, with the head somewhat vinous; the sides of the head and lower part of throat cinnamon reddish; two steel-blue spots on the sides of the head; two patches of shining ultramarine blue shading into violet on the sides of the neck; chin and centre of throat white; breast vinous; middle of abdomen and under tail-coverts white slightly washed with vinous, especially towards the sides; flanks, axillaries, and under wing-coverts pale grey; quills black, the primaries narrowly edged with white; the secondaries with broad white tips; inner upper wing-coverts, inner secondaries, and some of the scapularies black-spotted; two centre tail-feathers brown, indistinctly belted with dull brownish towards the tips; the succeeding feathers grey, with broad pale terminal belt, the outer feathers more or less white; tail below grey at the base, blackish in the middle, pale grey at the extremity; bill black; feet deep reddish.

The female is rather smaller than the male, and has more restricted and less vividly-coloured patches on the neck. The young are duller and without the neck patches. Hab., Lesser Antilles and St. Croix; it is frequently imported from Barbados.

In the Island of Montserrat this is called the Mountain Dove.

Mr. P. R. Lowe (*The Ibis*, 1909, p. 306) says that this Dove is fairly generally distributed over the island of Barbados; he does not, however, tell us anything about its habits, nor have I been successful in discovering any field-notes relating to it. There can be no doubt that its wild life would closely resemble that of *Z. auriculata*. In captivity it seems but little inclined to sit steadily, though often eager to pair and build. I purchased a pair on May 6, 1898, and secured a second pair by exchange on the 24th of the same month, and I should say they are as vigorous as any Dove living. When inclined to breed they become extremely aggressive, the male bird chasing and attacking even the much more powerful Bronzewing Pigeons, and making their lives a burden for days together. The song is soft and pleasing—*ooma, oom; oom, oom.* Early in June, 1897, Mr. O. E. Cresswell reared a young one of this species by putting the egg under a Barbary Turtle Dove. I tried the same thing on several occasions, but without result.

When my first outdoor aviary was built I tried a pair of *Z. aurita* with other Doves in the open, but they did not attempt to breed beyond building a nest in a small pigeon-pen with nest-pan, therefore I brought them indoors again. I did not find this species especially long-lived, partly, perhaps, because they were much persecuted by other Doves. A female which died in September, 1902, had developed a snow-white feather in one wing, which gave it a curious aspect.

Six examples of this Dove from Union Island, one of the Grenadines, were presented to the London Zoological Society in 1873, and a great many examples have been presented to the Regent's Park Gardens since that date. It is not a rare species in the trade, and formerly could be purchased at about 10s. a pair, but of late years many dealers have raised their prices considerably.

Zenaida Dove (*Zenaida amabilis*).

Above brown; upper tail-coverts slightly rufescent; innermost upper wing-coverts, scapulars, and inner secondaries spotted with black; flights black, the primaries with narrow whitish edges; tips of secondaries conspicuously white; central tail-feathers brown, with an ill-defined dusky band at about the terminal third; lateral feathers grey with a subterminal black band,

the outer webs of the inner lateral feathers partly brown; head dull vinous, darker at back; cheeks and throat rufescent; chin whitish; two steel-blue spots, one above and the other below the ear-coverts; breast, abdomen and under tail-coverts deep vinous; sides, axillaries, under wing-coverts, and sides of rump grey; bill black, carmine-red near the gape; feet carmine-red; irides dark brown. Female not differentiated, but probably smaller and less brightly coloured. Hab., "Florida Keys, Bahamas, Cuba, Isle of Pines, Jamaica, Little and Grand Cayman (?), Haiti and San Domingo, Mona, Porto Rico, Tortola, St. Thomas, Virgin Gorda, St. Croix, St. Eustatius, Barbuda and Antigua." (Salvadori.)

Gosse says ("Birds of Jamaica," pp. 307-309): "The open pastures, or the grassy glades of pimento pens, are the favourite haunts of this pretty Dove, where it walks on the ground singly or in pairs. In such open situations it can discover and mark the motions of an intruder, and long before he is within gun-range it is upon the wing. Few birds are more difficult of approach, unless the intervention of a wall or a thick bush permit a concealed access. Its flight is rapid and forcible, and performed with a peculiar whistling of the wings, by which it is at once recognised, though unseen.

"The Pea-dove is frequently seen in the middle of dusty high roads, but whether they resort thither for the purpose of dusting, or to procure gravel, I cannot say, as they usually fly as soon as seen. When the rains have ceased, the increasing drought renders these, as it does many other birds, more familiar; and they may be seen lingering on the borders of streams and ponds. Indeed, they seem, of all our Doves, to haunt most the vicinity of water; particularly those dreary swamps or morasses which are environed by tall woods of mangrove. In the winter months, when the pastures are burnt up with drought, we may hear all day long their plaintive cooing, proceeding from these sombre groves, though it is not much heard in any other situation. The coo consists of five deliberate notes, loud but mournful, '*Sary-coat-true-blue*,' all in the same tone, save the second, which is short and elevated. It resembles the note of the Carolina Dove.

"The Pea-dove subsists on various fruits and seeds; pimento berries, orange pips, sop seeds, caster-oil nuts, physic-nuts, maize, and the smaller seeds of pasture-weeds are some of its resources. His flesh is white and juicy, and when in good condition is in general estimation."

Mr. Gosse kept several of these birds in a cage, and he says: "They were jealous of other birds, and, notwithstanding their gentle physiognomy, irritable and pugnacious." This is true of all the species of *Zenaida*, and, in fact, of most of the *Columbæ*.

Mr. J. L. Bonhote met with this species in the Bahamas "in pairs on the pine-barrens." (*The Ibis*, 1899, p. 517.)

The London Zoological Society acquired the first example exhibited at Regent's Park in 1861; subsequently many others were added. Russ, however, states that it is rare in the trade, though he himself possessed a pair in 1889, and several were exhibited in later years at the exhibitions of the "Ornis" Society.

Bronze-necked Dove (*Zenaida auriculata*).

The head is vinous with grey crown and two black spots on the side, one behind the eye, the other below the ear-coverts; the neck and breast are vinous, but the sides of the neck and nape are metallic violet, changing to glittering brass in certain lights; remainder of upper surface brownish-olive; vent and under tail-coverts buffish-white, slightly washed with vinous; extremity of tail below white. In other respects the plumage nearly resembles that of *L. aurita*.

The female is smaller and rather browner than the male; the metallic neck patch smaller. In the young the upper parts and breast have the feathers streaked and edged with white, the primaries and their coverts edged with rufous; no metallic neck-patches. Hab., South America, on the west from Pearl Island to Ecuador, Peru and Chili; and on the east from Fernando Noronha to Brazil, Argentina, Patagonia, and perhaps the Magellan Straits. In its wild state this Dove is seen abundantly in fields of lucerne, probably attracted by the tender green shoots in which many doves delight; the seeds of the giant thistle are also said to be much relished.

The nest consists of a slender platform of sticks, through which the two white eggs can easily be seen, situated in the fork of a tree, and by preference not far from the habitations of man; the destruction of their eggs and young by birds of prey having, it is supposed, driven them to seek the protection of the human species. The five sobbing notes of this Dove are soft and pleasing.

Speaking of it as observed in Chili (*The Ibis*, 1897, p. 298), Mr. Ambrose A. Lane says: "This dove is very plentiful throughout Central Chili. I saw only a few near Concepcion on going south in June (1890), when it was mid-winter there, and further south I found it only occurred as a summer visitant.

"It arrived at Maquegua (as a summer visitant) about the end of August. On going to Valdivia in September, I did not find it there, nor in any other locality I visited until I got to Rio Bueno, where it was plentiful on the banks of the rivers, on the margins and pebbly beaches of which it constantly appeared to be feeding.

"In Central Chili it breeds from November to December, and at Rio Bueno from Christmas till March.

"The nests are like that of the European Turtle-dove; those I found at Rio Bueno being usually placed in a thick bush or the fork of a tree overhanging or standing in water.

"I got a young bird to rear in January, 1891, at Rio Bueno; we took it from a nest in a 'quila' whilst going along the Rio Conta in a boat; but soon after we were shipwrecked on a rapid, and all my specimens, and most of my clothes, were swept away. I subsequently got a pair from another nest, but they were too young, and I could not get them to thrive; they died in consequence after I had had them a week."

Speaking of it as observed by him on Fernando Noronha, Mr. M. J. Nicoll says (*The Ibis*, 1904, p. 39): "This small Dove is the most abundant bird on the island. It is very difficult to find it when shot, owing to the dense undergrowth. I saw several large flocks sitting on the branches of a species of fig-tree which grows all over the island. Its note is a loud, rattling '*coo*.'"

The late Mr. Cresswell described the nesting of this species in captivity in *The Avicultural Magazine*, First Series, Vol. III., p. 205.

I purchased a pair of *Zenaida auriculata* on June 10th, 1897, and turned them into my garden aviary, where they assisted a pair of Necklaced Doves to incubate their eggs; so that I hoped I was about to breed some remarkable hybrids. In this, of course, I was disappointed. In 1898 I brought the birds indoors, putting them into one of my birdroom aviaries, where they remained till they died some years later; they are pretty birds, but very quarrelsome. The London Zoological

Society purchased its first five specimens of this Dove in 1870, and received many others subsequently; it reached the Amsterdam Gardens in 1888. Being freely imported, many private aviculturists have owned it, though I fancy the Martinican Dove is even better known. Russ keeps *Z. auriculata* and *Z. maculata* distinct in his work, and speaks of the latter as rare in the market.

Galapagan Dove (*Nesopelia galapagœnsis.*)

Upper surface brownish-olive; scapulars and upper wing-coverts brown, each with two black spots, one on each web; the centre of the feathers often whitish; outer web of outer upper wing-coverts whitish; primary-coverts and flights blackish, the latter with narrow pale edges and tips; tail greyish-brown, with a black subterminal band; forehead deep vinous; ear-coverts silvery grey with a black edging above and below; feathers of cheeks vinous edged with black; sides of neck with golden and lilacine reflections; throat pale rufous, changing to deep vinous on the breast; abdomen rusty vinous; under tail-coverts grey, more or less tinged with rusty; under surface of flights greyish; bill black; feet pink; irides dark brown; eyelids pale blue. Female rather smaller and paler. Hab., Galapagos Islands.

I have not succeeded in discovering any published notes on the wild life of this Dove. Four examples were presented to the London Zoological Society in 1893.

White-winged Zenaida Dove (*Melopelia leucoptera.*)

Upper surface, throat, and breast pale greyish olivaceous brown; back of head and nape somewhat purplish; the latter shot with golden-green; sides of neck shot with golden-green and lilacine; a broad white belt on the wing, from the bend to the tips of the greater coverts; bastard wing, primary-coverts, and flights brownish-black; primaries narrowly edged with white; secondaries margined with white at the tips; inner secondaries brown like the back; central tail-feathers rufous-brown; lateral feathers grey, broadly tipped with whitish-grey and with an ill-defined subterminal blackish band; a spot of black below the ears; throat and upper breast tinged with ochreous; lower breast, abdomen, under wing and tail-coverts pale grey; lateral tail-feathers below black with the broad tips greyish-white; bill black; feet pinkish purple; irides purple. Female rather smaller and with scarcely a trace of purplish on back of head and nape. Hab., "Southern border of the United States, from Texas, New Mexico, Arizona, and Lower California, southward to Costa Rica and the West Indies" (Salvadori).

J. G. Cooper ("Ornithology of California," pp. 515, 516) says that: "Not much is known of the habits of this Dove." "According to Mr. March, the species is gregarious, sometimes collecting in very large flocks. The eggs are white, like those of all the pigeons; size 1.30 × 0.90."

Major Bendire says ("Life Histories of North American Birds," Vol. I., pp. 146, 147): "The mating season begins early, usually about the middle of March, and the cooing and love-making of the male can be heard and seen almost any day during a stroll among the shrubbery found along the borders of the water courses, which seem to be favourite resorts for many of these birds.

"Their call notes are varied, much more so than those of any other species of this family found with us; they are sonorous, pleasing, and rather musical. On this account the natives keep many of them as cage-birds, calling them *Paloma cantador*, Singing Dove. They soon become very gentle and reconciled to captivity, feeding readily out of one's hand and allowing themselves to be handled without fear.

"One of their most characteristic call notes bears a close resemblance to the first efforts of a young cockerel when attempting to crow, and this call is frequently uttered and in various keys. While thus engaged the performer usually throws his wings upward and forward above the head, and also spreads his tail slightly. Some other notes may be translated into 'cook for you,' or 'cook for two,' 'cook-kara-coo,' besides a variety of calls; one of these, a querulous harsh one, resembles somewhat the syllables 'chàà-hää.'" "Nidification usually begins in the latter part of April in southern Arizona, and sometimes later. The nests of the White-winged Dove, like those of most of the members of this family, are as a rule rather frail structures, consisting of a slight platform of small sticks and twigs interlaced with each other, and lined more or less with bits of old weeds, stems of mesquite leaves, and dry grasses. Mr. G. B. Sennett found a nest of this species made of Spanish moss. No particular preference seems to be shown for certain trees. I have found many of my nests in mesquite trees, the most abundant in that locality; others were placed in walnut trees, willows, and cholla cactus, at various heights from the ground, from 2½ up to 30 feet.' "I believe but one brood is usually raised in a season. As near as I can judge, incubation lasts about eighteen days. The male relieves the female somewhat in these duties, but does not assist to any great extent; he, however, assiduously helps to care for the young.

"Their food consists of insects, small seeds, grain, if procurable, berries, mesquito beans, and the fruit of the sahuara cactus, *Cereus giganteus*, which seems to be a favourite article of food with many birds in Arizona.

"In the late summer these birds collect in small parties, and I found them not at all shy. I have frequently seen as many as a dozen feeding among the cavalry horses along the picket line in my camp, allowing the men to walk within 10 feet of them without flying off.

"The eggs are generally two in number, seldom one. They are mostly elliptical oval in shape—that is, equally rounded at each end; a few may be called oval. Their colour is a rich creamy tint when fresh, and readily perceptible then, but in many specimens, especially in such as were considerably advanced in incubation when taken, this delicate tint fades, in time leaving the egg a dull white."

Mr. C. F. Underwood, writing on the birds of the Volcano of Miravalles (*The Ibis*, 1896, p. 447), says: "Very common by the roadside, where they can be seen in flocks feeding on the ground, at which times I have got as many as a dozen at a shot."

Russ asserts that hitherto it has only existed alive in the Amsterdam Zoological Gardens; he overlooks the fact that the London Zoological Society received two specimens in exchange in June, 1874.

This Dove was bred in captivity by Miss Rosie Alderson in May-July, 1902, who published an account of her success in *The Avicultural Magazine*, First Series, Vol. VIII., pp. 295-297.

Sub-family Turturinæ.

We must now proceed to the typical Turtle Doves, birds generally admitted to be more easily bred than any other *Columbæ*, and capable of producing among themselves fertile hybrids to almost any extent; I can

well conceive that, if the whole of the species could be arranged in a natural linear series, the most nearly related species being paired up from first to last, it might be possible to unite the whole of the species of *Turtur* in one bird. In *The Avicultural Magazine* Second Series, Vol. II., pp. 191-198, Mr. T. H. Newman has published a very interesting paper "On Some Turtle Dove Hybrids and their Fertility," and he summarises the results at the end of his article showing that hybrids between *T. turtur* and *T. risorius*, and *T. tigrinus* and *T. risorius*, were perfectly fertile when paired with *T. risorius*. I bred some hybrids between *T. tigrinus* and *T. risorius*, and subsequently I received a hybrid, I think with *T. humilis*, which I gave to a lady friend who possessed a number of *T. risorius* (the white variety); when I last saw them there were hybrids in several degrees of relationship between the two forms I gave her and the white Doves, proving that there is practically no limit to the fertility of these mixed types; and, just as Mr. J. L. Bonhote succeeded in uniting five distinct species of Ducks in one individual, so, I feel convinced, might several (if not all) of the species of Turtle Dove be combined. The *Turturinæ*, or typical Turtle Doves, have a rather broad tail, consisting of twelve feathers, and the upper part of the tarsus is naked. Other characters which are given are not even of generic importance, since they only relate to coloration and marking.

Barbary Turtle Dove (*Turtur risorius*).

The prevailing colour of the cage form is a little paler than the supposed wild original, its upper surface being pinkish buff. The crown of the head, secondaries, base of primaries, lateral tail-feathers, lower part of abdomen, flanks and under tail-coverts bluish-grey; a black half-collar round the back and sides of the neck, the under parts pale, the greater part of the primaries dark brown; under surface of tail blackish, with white terminal band; bill blackish; feet deep flesh pink; iris crimson, orbital skin whitish. Female practically indistinguishable from the male, the sexual differences having, apparently, been bred out.

The white form of the species, which Mr. Abrahams informed me was produced by in-breeding, is much more highly prized than the common type; it has no black collar, and its plumage is pure snow white, the bill being flesh pink. Why this sport should be called "White Java" it would be difficult to say; but this is the name under which it is usually exhibited at our shows. As might be expected, it breeds freely with the common variety, and the result is generally one chick of each form.

The origin of this Dove, which is analogous to the Canary among Finches, is, according to Salvadori, uncertain, some naturalists having assigned it (as a fancy variation) to one species and some to another. Being practically a fancy bird, it would have little interest for the foreign bird-keeper were it not for its usefulness in hatching the eggs and rearing the young of shy breeders among foreign Doves.

"The Collared Turtle or Laughing Dove" is the most popular of all the family, simply from the fact that, up to the present time, a pair can be obtained at almost any bird-shop for about 3s., and that they are no sooner established in a good-sized cage than they will go to work to rear a family.

The sneering laugh which the Barbary Turtle Dove indulges in whenever it alights is amusing until one becomes accustomed to it, and then it sometimes comes in so opportunely as to be more or less irritating. After keeping and breeding the species for two or three years I grew weary of its stupidity, and sold the birds for what they would fetch. A friend of mine who took five of them informed me that whenever he made an extraordinary fluke at billiards the Doves were certain to laugh, so that sometimes he felt almost inclined to wring their necks. In order to breed them a pair should be placed together in a cage about 2 ft. in height by 18 in. square, and a box about 2 in. deep and 6 in. square half-filled with sawdust or bran should be hung up in one corner near the top. No extra food is required, but a little old mortar or crushed cuttle-fish should be sprinkled on the sand. In a very short time two white eggs will be laid, incubated by cock and hen alternately, the cock sitting all day, and in about eighteen days the hideous naked squabs will leave the shell and be greeted with the liveliest demonstrations of satisfaction by the parents. No sooner are they large enough to leave the nest than they make themselves such a nuisance to their parents, by racing after them clamouring for food all the livelong day, that it is hardly to be wondered at that, when able to feed

White Barbary Dove.

themselves, the parents resent these incessant worries. This is the signal for removing the young Doves to a separate cage; the old birds will then immediately set about preparations for the second family. Of course, in an aviary many pairs may be associated, always having due regard to its size, and the multiplication will then be very rapid. This species has been successfully paired with the British Turtle Dove. I hoped, indeed, to try the experiment myself, and having taken a fresh egg from a Kentish nest, I carefully bedded it in sawdust, brought it home, and substituted it for one of my Collared Doves' eggs. Alas! either it was unfertile, or the jarring of the train had destroyed its life, for it failed to hatch, and thus my intended experiment was nipped in the bud. In its wild state a supposed progenitor of this bird builds a platform of sticks for a nest on trees or bushes, cypresses being selected in preference to others. Being perfectly hardy, it can be safely wintered in an outdoor aviary, and is all the stronger for it (the same may be said of many other birds which are rendered liable to all kinds of diseases by heat and coddling, the Canary being a striking example of the delicate constitution thus developed). Indoors in a warm building I found the Barbary Turtle Dove liable to catarrh, accompanied by a cough, lassitude, ruffled feathers, and want of appetite. The cold

I cured by dropping a couple of peppercorns down the birds' throats, and cold treatment during the following winter completely restored them to health. The only food required for this species is a mixture of two parts white millet to one of dari (Indian wheat), a little white kidney-shaped seed sold by most corn-chandlers.

Some years after I had sold my common Barbary Doves, I purchased a pair of the white variety in the hope of making them useful in hatching out and rearing the young of other Doves. The white birds speedily increased to eleven, and I subsequently tried them with the eggs of various species of foreigners, but unfortunately without any success; other aviculturists have, however, found them very useful. Eventually, after breeding several hybrids between these and the Necklaced Dove, I gave away the whole of them, the white birds to one friend, the hybrids to another who already possessed a sufficient stock of White Barbary Doves; with the latter, as already stated, they inter-bred freely.

Ashy Turtle-Dove (*Turtur ferrago*).

Back and rump ashy-brown, more ashy on the latter; wings dusky, the edges of the scapulars and borders of the upper wing-coverts dark rusty rufous; tail bluish-black, with a broad terminal, nearly pure-white belt; head bluish-ashy, rufescent on back of head and nape; tips of feathers on sides of neck lavender-grey; below brown, becoming whitish on the abdomen and white on the under tail-coverts; bill blackish; feet dull purplish-lake. Female not differentiated. Hab., "S.-W. Siberia, Turkestan, Cashmere, and Nepal; it winters in Central India; straggler in Ceylon." (Salvadori.)

Hume says of this species ("Nests and Eggs of Indian Birds," Second Edition, Vol. II., pp. 349, 350): "Our Indian Turtle-Dove breeds throughout the lower ranges of the Himalayas, from Afghanistan to Sikhim, at any rate, at elevations of from 4,000 to 8,000 feet. It is for the most part only a summer visitant to these hills. A few pairs linger during the winter in the lower valleys, but the great majority migrate at this season to the Central Provinces and Central India, where it may at times, in the cold weather, be found associated with the next species." (*T. meena.*)

"I have found eggs early in May and late in August, but the great majority lay in June. It makes a loose, but rather more substantial, twig nest than many of its congeners, placed on some horizontal branch of a large tree, usually not far from the extremity.

"Colonel C. H. T. Marshall, writing from Murree, says: 'This species breeds in June in the pine forests, but I have found their nests in all kinds of trees. The eggs are invariably two in number. I conclude, from the very different dates on which I have found the eggs, that they have two broods, but I am not certain of the fact.'"

According to Captain Hutton, this is a "summer visitor at Mussoorie, where it arrives early in April, when every wood resounds with its deep-toned cooing."

Respecting the eggs, Mr. Hume thus describes them: "Regular ovals, pure white, and very glossy. In size they exceed those of *T. risoria*, and are slightly smaller and decidedly less pointed than those of *Crocopus phœnicopterus* and *C. chlorigaster*.

"In length they vary from 1.1 to 1.34, and in breadth from 0.85 to 1.0; but the average of twenty-one eggs is 1.22 by 0.93."

An example of this Dove reached the London Zoological Gardens on May 11th, 1907.

Eastern Turtle-Dove (*Turtur orientalis*).

Differs from the preceding species in its vinous-reddish abdomen and grey under tail-coverts; the tail with lavender-grey terminal belt. Female probably smaller and duller than the male. Hab., Himalayas to Central India, through Burma to Formosa, Manchuria, Corea and Japan; accidental in Europe. (Salvadori.)

Hume says of this species ("Nests and Eggs," Second Series, Vol. II., pp. 350, 351): "Sykes's Turtle-Dove is, as far as I have been able to ascertain, a permanent resident of the hilly portions of Southern India, of the broken belts of hills and forests that stretch across the Continent of India from the northern portion of the Western Ghats to Cuttack; thence it extends into Eastern Bengal, Cachar, Assam, and along the bases of the Himalayas (which it does not ascend to an elevation of above 4,000 feet), as far west as the Sikhim and Nepal Terais, and again southwards into Arracan, Pegu, and the north of Tenasserim.

"It appears likely that they lay from December to April.

"Mr. V. Irwin sent me a couple of eggs from Hill Tipperah, taken at the end of March; and Mr. F. R. Blewitt says: 'This species certainly breeds in December and January. In the beginning of the latter month a pair of young birds was brought to me from the magnificent forest-covered hills some fifteen miles south of Sumbulpore.'

"Here I found the birds in great numbers, and in the early mornings and evenings the forests resounded with their thrice-repeated, deep, guttural 'coo,' so unlike that of other Doves.

"At this time the Doves were single or in pairs—a certain indication of the breeding season. My experience leads me to suppose that this species congregates in flocks after the breeding season, for in March, 1869, I found a flock some twelve miles south of Seoni (Central Provinces)."

Apparently the nest is circular, neatly constructed of twigs, and with a somewhat deep egg-cavity; the eggs, two in number, are broad regular ovals, pure white, and fairly glossy.

Russ observes that this species reached the Zoological Gardens of London in 1864, and has since that time been continually in the market, though rarely and singly. At the exhibition of the Ornis Society, in the year 1893, two pairs, from H. Schulze, of Altenburg, and G. Reisz, of Berlin, were present."

The London Zoological Society has altogether owned a fair series of this species, and it is surprising that it should not have been bred at the Gardens.

Madagascar Turtle-Dove (*Turtur picturatus*).

"Head grey, paler on the chin, and gradually shading into ashy-vinous on the remainder of the neck and breast; feathers of the hind neck and sides of the neck have concealed bases black, and tips greyish-vinous; the vinous of the neck shades into chestnut on the upper back, portion of the scapulars, and the smaller upper wing-coverts; apical portion of the scapulars, remainder of the wings, upper tail-coverts, and central tail-feathers brown; primaries with narrow whitish edges; lower back and rump slaty-grey; abdomen pale vinous; under tail-coverts white; marginal under wing-coverts vinous, the inner ones and axillaries greyish-brown; lateral tail-feathers slaty-grey, with an obsolete subapical black band and a broad terminal grey band, which, on the inner web of the two outer feathers, is almost white" (Salvadori); "iris yellowish-brown; beak pinkish horn-colour; nostrils and skin

round the eye and feet lake-red." (E. Newton.) Female "considerably smaller, the purple patch on the back and wings duller and less extensive, and all her colours are less bright." (T. H. Newman.) Hab., Madagascar. Probably introduced into Réunion, Mauritius, the Seychelles, and Chagos Islands.

Grandidier says ("History of Madagascar, Birds," Vol. XII., p. 462): "These Turtle-Doves are very common in all the Island of Madagascar, particularly in the plantations and cultivated fields, where they are found in pairs, and sometimes in little bands of from six to eight individuals. Like their allies of Europe, they walk well and fly with rapidity without noise; they make quick turnings to baffle the pursuit of their enemies; their cooing is soft and monotonous. They feed on grain, and make great ravages in the rice fields at the time of sowing and at the season of harvest. Their flesh is very delicate. Their nest, like that of all pigeons, is flat and roughly made of grasses and small roots; it is placed in a tree at a low elevation; their eggs are white, and measure 30 mm. by 23. The Malagasy call this Turtle-Dove *Demohina*, *Lemohina*, or *Dimohy*."*

In *The Avicultural Magazine*, Second Series, Vol. VI., pp. 79-84, Mr. T. H. Newman has published a most instructive account of his success in breeding this species in his aviaries. The article is illustrated by a characteristic uncoloured plate. Mr. Newman observes: "In shape this is the least graceful of any Turtle-Dove that I have seen, being of a sturdy build, with relatively short tail and longish legs, which points to the fact that it spends much time on the ground." These characters certainly seem to correspond pretty closely with at least some of those of the *Geotrygoninæ*, and to support my view of the affinity of *Leptoptila* to *Turtur*.

Russ quotes the following observations by Schlegel and Pollen:—"It is one of the commonest Doves, and lives in companies of ten to thirty individuals in cultivated neighbourhoods. Its flight is very rapid. It feeds upon grain, and at the sowing and reaping of the rice commits great havoc in the fields. Its flesh is tender and much relished. At Réunion it is still somewhat rare, and inhabits the mountain forests, where it is shyer and more difficult to shoot than in Madagascar. Its voice sounds short and monotonous. The nest resembles that of the European Turtle-Dove. It permits itself to be easily tamed, and therefore is much kept in cages by the Creoles."

Two specimens of this Dove reached the London Zoological Gardens in 1866, and one in 1867. Russ says that it is extremely rare at the present day, and only arrives singly in the German market. Mr. Newman saw those from which his pair was selected advertised as "Aldabra Doves," which, however, they proved not to be.

ALDABRAN TURTLE-DOVE (*Turtur aldabranus*).

Upper surface mostly brown, slightly olivaceous; upper mantle vinous; lesser upper wing-coverts chestnut; lateral tail-feathers with a broad pale terminal belt, becoming nearly white on the outside feathers; head, neck, and breast, as well as front of abdomen, vinous; feathers on back and sides of neck black at base and lilacine at tips; centre of abdomen and under tail-coverts white; flanks broadly greyish-brown; under wing-coverts rufescent brown; axillaries greyish-brown; tail below black, with a broad terminal greyish-white belt; bill lead-colour tipped with yellowish; feet flesh-colour; irides red. Female smaller. Hab., Aldabra Island.

Mr. C. E. Bewsher says (cf. "Proceedings of the Zoological Society," 1877, p. 300) that the nearly related *T. comorensis* is common in woods, and that its native name is Shukerron Dhungow.

T. aldabranus was described and figured by Dr. Sclater in 1871 from a pair of Doves presented to the Zoological Society of London in June of that year. Dr. Sclater says ("Proceedings of the Zoological Society," 1871, pp. 692, 693): "The pair of this Dove which Mr. Newton sent us were in good health; but the hen had an injured wing, which prevented her from flying off the ground. Notwithstanding this, when placed in the large Western Aviary, they quickly showed symptoms of breeding, and about three weeks after their arrival built a nest in the interior of the compartment assigned to them. A few days after this, as our head keeper, Mr. B. Misselbrook, informs me, two eggs were laid, and incubation was commenced, the male taking turns with the female on the nest. In sixteen days one young one was hatched, on the 17th or 18th of July, and is still living in the aviary. The other egg turned out to be addled; and I now exhibit its shell, which, like that of all Pigeons, is of a spotless white. It measures 1.35 inch by .95 inch. About the end of September the hen sickened and died."

Russ observes that "our German bird-dealers only occasionally advertise this Dove"! He does not mention a single aviculturist or foreign Zoological Society which has possessed it, and it is quite likely that the birds advertised were not Aldabran, but Madagascar Turtle-Doves.

HALF-COLLARED TURTLE-DOVE (*Turtur semitorquatus*).

The adult male has the crown grey, tinted with reddish-buff in front and at the sides, the forehead being almost white; rest of head, neck, and chest pink, paler on the chin and throat; a broad black collar partly grey-margined at the back of the neck; the back, inner half of upper wing-coverts, inner secondaries, and two centre tail-feathers olivaceous brown; outer wing-coverts bluish slate-coloured; rump washed with grey; bastard wing and primary-coverts blackish; primaries similar but partly edged with a paler tint; outer secondaries dark grey; lateral tail-feathers brownish-grey with a blackish central belt and bluish tips; flanks, abdomen, thighs, and under tail-coverts leaden grey; under wing-coverts darker; tail below black at base, but pale grey towards the extremity; feet lake-red; bill blackish; iris reddish-orange.

The female is very like the male, but the forehead is not so white; it is possible to note the difference when the sexes sit side by side. Africa generally from about 14° N. lat. southwards. In its wild state this bird usually nests in the forks of *Acacias* or silk trees during and after the rainy season; it feeds on stone-fruits, berries, grain, and small seeds.

In Stark and Sclater's "Birds of South Africa," Vol. IV., p. 168, we read:—"The Woodwards state as follows: 'These Doves are very common throughout the country, and their loud and pleasant cooing is heard wherever there is any cover for them during the warmer months of the year. They are sometimes seen in large flocks, but, as a rule, go about in pairs, and feed principally on tree berries. The natives have no love for these birds, as they devour a considerable quantity of grain during the planting season; but there would not be much loss if care were taken to plant the seed deeper. They get very fat during the summer, and are excellent eating. This Dove lays its two white eggs on a few sticks, which are merely an apology for a nest, generally placed in a low tree.'"

"Two eggs taken near Durban on June 1, by Mr. A. D. Millar, now in the South African Museum, are

* Quoted from Mr. Newman's interesting article.

pure white, smooth, and rounded oval in shape; they measure 1.20 by .95."

My friend, Mr. Frank Finn, gave me a pair of these Doves in the spring of 1893, and I turned them out into an aviary with two English Starlings and a Mocking Bird. I fixed up a hamper lid near the roof in one corner, and they soon commenced to lay, and continued to do so from time to time until I parted from them. Unfortunately, constant interruptions, due to the playfulness of my Mocking Bird and the terrified rushes of the Starlings to escape him, kept the unfortunate Doves from sitting in peace; so that all the eggs got either broken or addled. Eventually, I exchanged them for other birds in 1895. In 1899 Major Horsbrugh brought home a batch from West Africa, and I became possessed, through his kindness, of a second "pair"; these I turned into an outdoor aviary, and a year or two later into a fowl-run adjoining (later thrown into the said aviary). Here one of them died on the 12th November, 1902, and was identified by the British Museum authorities as *Turtur decipiens;* the other escaped, together with two examples of *Geopelia humeralis*, my servant having entered the run to feed the fowls and left the door open behind her.

The London Zoological Gardens first exhibited three specimens of this species in 1870, since which date many specimens have been added to the Regent's Park collection.

Mr. T. H. Newman has published a long and interesting article on this Dove in *The Avicultural Magazine*, Second Series, Vol. V., pp. 318-324.

Deceptive Turtle-Dove (*Turtur decipiens*).

Above pale earth-brown, slightly tinged with vinaceous on the front of the mantle, darker from the centre of back posteriorly; bastard-wing brownish-black, partly slate-grey on outer webs; flights brownish-black, darkest on outer webs; outer wing-coverts, excepting the primary-coverts, which are brownish-black, pearl-grey, more or less tinged with brown and with paler edges; lateral tail-feathers slaty-blackish on basal half, pale brown shaded with grey and becoming gradually paler from within outwards, the outermost feathers being broadly grey whitish at tips; front of head ashy, bluer at centre of crown, then shaded with vinous at the back of all the feathers and becoming quite vinous on the back and sides of neck and the breast; sides of head grey washed with vinous; no black feathers in front of the eyes; chin and centre of throat white; a black half-collar, partly edged with grey-whitish in front, at back of neck; sides of rump and of abdomen leaden-grey, the latter faintly tinged with brownish; centre of abdomen whitish; under tail-coverts pearl-grey with whiter borders; under wing-coverts leaden-grey; basal half of tail below black; terminal half pale pearl-grey, becoming gradually lighter towards the tips; bill apparently slaty-blackish; feet red; irides probably brown; orbital ring orange.* Female probably a trifle smaller and with whiter forehead. Hab., "Dongola." (Salvadori.)

Possibly Count Salvadori might regard this as *T. ambiguus;* but he himself says of the latter: "It is quite possible that a good series of specimens will show that *T. ambiguus*, Boc., is not different from true *T. decipiens*, the former being only somewhat smaller and more grey on the sides of the head or cheeks; but I find that in two specimens from Sobat (*Emin Pasha*) . . . . the amount of grey on the cheeks is rather variable, and although the difference in size seems constant, I do not think it is sufficient to indicate specific difference." Hab., "Zambesi, Benguela, and Sobat River, at about 9 deg. N. lat." (Salvadori.)

Heuglin says ("Ornithologie Nord-Ost Africas," Vol. I., p. 833): "It lives, as a resident bird, in pairs and in small and larger flocks; preferably on thorny acacias and *Nabag*-trees. Its note is just as loud, and like a mocking laugh, as that of *Turtur semitorquatus*. At the wells of the Bainda Desert in October we came across vast flocks of this laughing Dove. It is not timid, and is fond of visiting the encampments of the caravans, where it searches for food in the manure. Its food consists besides in seeds of grasses, maize in the ear, berries and fruits of *Zizyphus, Moringa*, and the like."

As previously stated, an example given to me by Major Horsbrugh was identified as *T. decipiens* by the authorities at the Natural History Museum; so also was a specimen received by Miss Alderson (cf. *The Avicultural Magazine*, Second Series, Vol. I., p. 237). In May, 1906, Mr. Meade-Waldo presented six examples to the London Zoological Gardens, and doubtless others have, from time to time, been confounded with *T. semitorquatus*. I believe Mr. T. H. Newman has also had this Dove.

Double-ringed Turtle-Dove (*Turtur bitorquatus*).

Above mostly earth-brown; outer wing-coverts leaden grey; bastard-wing, primary-coverts, and flights brownish-black; lateral tail-feathers bluish-grey, darker towards the base, the outer feathers with the entire outer web bluish-grey; crown grey, paler in front; chin whitish; sides of head, neck, and breast rich vinous, fading to white on lower abdomen, vent, and under tail-coverts; a broad black collar, edged in front with white, on hind neck; under wing-coverts and flanks leaden-grey; tail below black on basal and whitish-grey on terminal half; bill black, red at base of gape; feet coral-red; iris orange-yellow; orbital ring red. Female probably with the forehead paler than in the male. Hab., "Java, Lombock, Sumbawa, Flores, Solor, and Timor." (Salvadori.)

Mr. Frank Finn (*The Ibis*, 1901, p. 443) speaks of so great a number of this species being imported into Calcutta as cage-birds that they were quite a drug in the market.

I have not come across any notes respecting the wild life of this bird, nor does Russ quote any in his work. He says: "It is only rarely imported alive; in the year 1839 it arrived in the Amsterdam, and in the year 1863 in the London, Zoological Gardens. In Germany, the chemist Landauer has possessed it, and in the year 1883 Bode, of Leipzig, imported it; since then it has always come to hand here and there singly." The last example recorded in the ninth edition of the "List of Animals" as having found its way to the Regent's Park Gardens was presented in November, 1894.

Cape Turtle-Dove (*Turtur capicola*).

Upper surface mostly greyish-brown, changing to leaden-grey on outer upper wing-coverts and sides of lower back and rump; primary-coverts and flights blackish, with pale narrow edges; central tail-feathers browner, the lateral feathers black on basal half, grey on terminal half of inner feathers and white on outer ones; crown leaden-grey, paler on the forehead, changing to vinous-grey on sides of head, neck and chest; front of cheeks and throat grey; a more or less defined black loral line; a broad black collar, partially edged in front and behind with grey, on the hind neck;

* Described from a male example identified as this species at the British Museum; it differs very slightly from Salvadori's description, which was based upon a single example.

middle of abdomen buffy white; under tail-coverts white; under wing-coverts leaden-grey; tail below with the basal half black, the terminal half white; the outer feathers with the outer web white; bill black; feet pinkish-red; irides brown. Female probably with greyer forehead. Hab., Cape Colony to Natal and Southern Transvaal.

Messrs. Stark and Sclater say ("Birds of South Africa," Vol. IV., p. 171): "The Cape Turtle-Dove is one of the commonest birds in Cape Town and the suburbs, where its constant harsh cooing becomes somewhat wearisome; it is generally about in pairs, though a good many may sometimes be seen together feeding on the ground; it is comparatively tame, and allows a quite near approach. Its food consists of grain and seeds, and is almost entirely obtained on the ground.

"It nests near Cape Town in September; a little later, from October to December, in Natal; while Eriksson and Marshall state that it can be found breeding at almost any time during the year. The nest is constructed of a few sticks, so loosely put together that the eggs can usually be seen through when looked at from below. The sticks form a flat platform, and on it are laid two shiny white eggs of oval shape with equally round ends, measuring 1.10 to 1.20 by .87 to .90."

Two specimens of this Dove were presented to the London Zoological Society in 1886. Russ does not mention the species.

Damara Turtle-Dove (*Turtur damarensis*).

Differs from the preceding in its generally paler colouring, the forehead and front of cheeks being almost white; the grey shade absent or ill-defined on the cheeks, neck, and breast; it is also a rather smaller bird. Hab., Angola, Damaraland, and East Africa from the Transvaal to Mount Elgon, also the Comoro Islands and Madagascar.

This is regarded by Messrs. Stark and Sclater (I think rightly) as a mere race or "sub-species" of *T. capicola*. They quote the following account of its habits from Andersson: "This is the most abundant species of Dove in Damaraland and the parts adjacent. It cannot be strictly said to be a gregarious species; yet numbers are often found in close proximity, both on trees and on the ground, and rise in one flock when flushed, producing a great noise by the rapid concussion of their wings above their backs. They seek on the ground for their food, which consists almost exclusively of insects. They build in small trees, generally at the extremity of a bough, constructing a rough nest of a few twigs, with no lining of any kind. The eggs are two in number, of a pure white. I have observed these Doves building on Aug. 20, and have found their eggs abundantly at the end of December, so that it is probable they produce two broods in the year."

Miss Alderson received four specimens of what she believed to be this Dove, in a consignment of birds from Africa. She says that it agrees with the description given in the British Museum Catalogue. The birds went to nest soon after they were received, and continued to do so later, but either the eggs were broken or the young came to grief.

Vinaceous Turtle-Dove (*Turtur vinaceus*).

The adult bird has the head and neck wine-pink; the forehead paler (especially in the male); the crown somewhat greyish; a black line in front of the eyes, and a broad black collar on the back of the neck, edged with whitish above; the back, scapularies, tertials, and inner half of wing-coverts, earth-brown; rump and upper tail-coverts greyer; outer upper wing-coverts pale grey with lighter edges; bastard-wing, primary-coverts and primaries black, with pale edges; secondaries smoky-grey with narrow pale edges; two centre tail-feathers earth-brown, the rest black towards the base, white towards the extremity, the outer feathers also white-edged externally at base; below, the chin, throat, lower abdomen, vent, and under tail-coverts are white; the under wing-coverts are grey; the tail below is black towards the base, but with the terminal half, as also the edge of the outer feathers, white; feet brown; bill black; iris reddish-chestnut. Hab., Tropical N. Africa from Senegal and the Gold Coast on the west to Ngur and Bogos on the east. It is also believed to occur at Loango.

Lord Lovat thus describes the soft parts: "Iris brown; bill black; feet red."

When feeding on the ground or drinking, this species collects in countless numbers, but during the heat of the day it is seen in pairs or family parties; its food when free consists chiefly of tufted maize and grass-seeds. The song is said to resemble that of the common Barbary Dove, but to be less penetrating.

This species has been, since 1858, when it first began to breed there, one of the commonest and most abundantly bred species in the London Zoological Gardens; it certainly continued to breed there as recently as 1900, and, from first to last, I should think the Society must have possessed quite six dozen examples. Yet Russ says: "With us this Dove is very rare in the market." I must admit that I have never myself seen it in a London bird-shop, but then I have never asked for it.

Burmese Collared Turtle-Dove (*Turtur xanthocyclus*).

Upper surface pale brown, changing to pearl-grey on the outer upper wing-coverts and secondaries; rump partly suffused with grey; bastard-wing and primary-coverts pearl-grey with brown tips; primaries dark brown, with more or less partially pale edges; lateral tail-feathers leaden-grey, gradually fading to white towards the tips; head, neck, and chest pale vinaceous, fading to white on the chin; forehead paler; broad black crescentic collar, edged above and below with white on the hind neck; the vinaceous colour of the chest changing to grey on the flanks, abdomen, and under tail-coverts; under wing-coverts pearl-grey; flights below brown, becoming ashy-white towards base of inner webs; tail below with the basal part black, abruptly changing to whitish-grey on the terminal part; bill black; feet dark pinkish-red; irides red; orbital ring broad and yellow. Hab., Burma, and possibly China.

Mr. T. H. Newman, in a highly interesting illustrated article in *The Avicultural Magazine*, Second Series, Vol. IV., pp. 321-326, gives cogent reasons for separating this Dove as a sub-species from the Indian Collared Turtle-Dove. The only question in my mind is, supposing that the Chinese bird should prove to be the same as the Burmese, whether Severtzoff's name of *chinensis* should not stand as a synonym of it.

Hume says ("Nests and Eggs of Indian Birds," Vol. II., p. 358): "The nest has been taken at Thayetmyo." Describing the Indian form (which he calls *Turtur risorius*), he says: "I myself have taken the eggs in every month from December to August, and I have no doubt that others have found them (though the bird is so common that no one writes about it) in the remaining quarter.

"The nest is placed on any bush or tree, prickly and thorny sites, such as are afforded by the *Zizyphus*,

wild date, babool, *Euphorbias*, etc., being often, but by no means universally, selected. Generally the nest is within 15, but very rarely within 5 ft. of the ground; but, again, I have found it 30 or 40 ft. up in a large tree. The nest is placed indifferently in a fork, in amongst numerous prongs, on a broad horizontal bough—anywhere, in fact, where a secure and sufficiently wide basis can be found, and is usually a mere platform some 6 inches in diameter, composed of thin twigs and lined with grass-stems, with a slight depression in the centre. Occasionally the nest is rather more saucer-like, a few roots or grass-stems are not unfrequently intermingled, and I have seen nests composed wholly of grass. "Like our other Doves, they lay two eggs as a clutch, and rear several successive broods."

"The eggs are usually broad and perfect ovals, white and glossy." Three examples of this Dove were received at the London Zoological Gardens in October, 1896. Mr. Newman had a young one produced between this species and a Half-collared Turtle-Dove.

Dwarf or Ruddy Turtle-Dove (*Turtur humilis*).

The adult male is vinous-red; the head, lower back, rump, and upper tail-coverts grey; the head, especially the forehead, is paler; a black collar on the back of the neck; outer greater wing-coverts dark greyish; primary-coverts and quills blackish, with pale margins; chin whitish; throat vinous-red; breast and abdomen paler; the flanks grey; lower abdomen ashy; under tail-coverts white, more or less greyish; tail below greyish, with a broad whitish terminal belt, the central feathers brownish; outer web of outer feathers white; feet purplish-red; bill black; iris dark brown.

The female is very distinct, the general colour being a pale brown, the vinous-reddish tint of the under-surface being much greyer than in the male, and the black collar on the hind neck edged above with ashy. Hab., Continent of India, from Assam through Burma to the Andamans, and eastwards through Cochin-China and China to the Philippines.

Jerdon says ("Birds of India," Vol. III., p. 483): "It affects large groves of trees near cultivation, often feeding under the shade of trees, but also betaking itself to fields, grass downs, and bare spots near rivers or tanks. Its *coo* is short, deep, and grunt-like. Blyth states that he has bred them in confinement in an aviary, and that cages full of newly-caught birds are often to be seen in the Calcutta bird-shops."

Hume, who evidently regards this and the extremely nearly related *T. tranquebaricus* as identical, says of it ("Nests and Eggs," Vol. II., pp. 359-362): "The Western Ruddy Dove breeds in all parts of India, but is very capriciously distributed, and I am unable to say what kind of country it prefers, and why it is common in one district and rare in a neighbouring one in which all physical conditions appear identical.

"It is very common in the bare and treeless region that surrounds the Sambhur Lake. It is common in some dry well-cultivated districts, like Etawah, where there are plenty of old mango groves. It is very common in some of the comparatively humid tracts, like Bareilly, and again in the Sâl jungles of the Kumaon Bhabur and the Nepal Terai. On the other hand, over wide extents of similar country it is scarcely to be seen. Doubtless there is something in its food or mode of life that limits its distribution, but I have never yet been able to make out what this something is.

"Eggs may be found any time between January and July, but my impression is that normally they have only two broods, and lay for the first as a rule in January, for the second in May or June.

"I have always found the nests at or near the extremities of the lower boughs of very large trees, at heights of from 8 to 15 ft. from the ground, and laid across any two or three convenient horizontal branchlets. As a rule, the nests are excessively slight structures, composed of a few slender sticks or grass-stems, or both, so loosely and sparsely put together that the eggs can generally be spied from below through the bottom of the nest.

"Two is the number of the eggs."

"The eggs (as a body, the smallest of all our Doves' eggs, except those of *T. senegalensis*, which are of much the same size) are, I think, typically slightly more elongated ovals than those of our other Indian species of this genus. They are, of course, spotless and glossy, but, though I have myself taken pure white ones, by far the greater majority of them are of a pale ivory-white, which is very conspicuous when they are placed alongside china-white eggs, such as those of the blue Rock pigeon." "In length the eggs vary from 0.98 to 1.1, and in breadth from 0.75 to 0.85; but the average of twenty specimens is 1.02 nearly by 0.8."

Miss Alderson purchased two cocks of this species in 1902, but she says that it is not often imported. Russ also states that it is very rare in the German market, "though on one occasion G. Bosz, of Cologne, imported a considerable number. It was present in the Amsterdam Gardens in 1844, and it arrived at the London Zoological Gardens in 1862, and went to nest successfully in 1864," in which year six examples were presented to the Society; two examples were also bred in the Gardens in 1900. Mr. T. H. Newman, who had examples of this species, gave me a hybrid between it and the Barbary Turtle-Dove in 1905. This I eventually gave away, and I believe it continued to breed with Barbary Doves.

Chinese Turtle-Dove (*Turtur chinensis*).

Above pale brown; outermost wing-coverts leaden-grey; tail with the two feathers next to the central pair blackish-brown, greyish at base; next feather black, tipped with grey; three outer feathers black, broadly tipped with white; head grey, paler on the forehead; back of head with a vinous tinge; nape black, spotted with white at the tips of the feathers; under surface rich vinous, paler on chin and abdomen; inner under wing-coverts nearly black; marginal under wing-coverts, axillaries, sides, and under tail-coverts grey; bill brown; feet rose-red; irides orange-red. Female rather smaller, and with the irides yellow. Hab., "Eastern China, from Canton to Shanghai; Formosa and Hainan." (Salvadori.)

Mr. J. D. de La Touche, writing on the "Birds of Formosa" (*The Ibis*, 1895, p. 338), says: "Abundant on the plain. Occurs sometimes in very large flocks. Native name, 'Katsui.'"

Mr. J. C. Kershaw (*The Ibis*, 1904, p. 244) speaks of it as the commonest resident Dove on the Quangtung coast.

Messrs. La Touche and Rickett, speaking of the "Nesting of Birds in Fohkien," say (*The Ibis*, 1905, p. 57): "A very common resident. The nest is the usual flimsy structure of sticks, placed in a tree, high bush, or thick creeper. The eggs are elliptic oval in shape, with (sometimes) one end more pointed than the other.

"Seventeen eggs average 1.14 by .87 in.; the largest, 1.20 by .89, the smallest 1.08 by .85."

Mr. J. D. de La Touche, in his "Field Notes on the Birds of Chinkiang" (*The Ibis*, 1907, p. 16), says:

"Abundant and resident. I have obtained eggs all through the spring and summer. On May 24 I found a Dove of this kind sitting on two much-incubated eggs in an old nest of *Dryonastes perspicillatus* placed on a bamboo some 12 ft. above the ground. A nest with two fresh eggs, found on May 29, was built in the upright fork formed by the two main boughs of a tree. It was fully exposed to view, and was practically suspended between the two branches."

Russ says that although this species was already in the Amsterdam Zoological Gardens in 1843, and in those of London in 1869, it is extremely rare and only appears singly in the German market. At Regent's Park a fair number of specimens has been exhibited, the last recorded in the ninth edition of the "List of Animals" having been presented in 1891. The first examples which I received of *T. tigrinus* were sold to me as this species.

NECKLACED DOVE (*Turtur tigrinus*).

The adult male has the head bluish-grey, washed on the crown, nape, and sides of neck with vinous-brownish; the mantle is black, each feather in front spotted with white, but towards the back with buff;

NECKLACED DOVE (*Turtur tigrinus.*)

the upper parts rufous-brown, the feathers of the back with paler fringes; the scapulars and upper wing-coverts paler, the lesser coverts with conspicuous black shaft streaks; secondaries and tertiaries deep rufous-brown, with black shaft streaks; outermost coverts with grey-brown inner webs, black shaft-streaks, pearl grey outer webs, fading externally to a pure white margin; primaries blackish with pale outer margins; two central tail-feathers brown, next pair black with slightly greyish terminal belt, succeeding pair black with ash-grey terminal belt, remainder black with broad terminal white belts; lores black; chin and centre of throat white; breast dull vinous, becoming paler on the abdomen, and partly white on the vent and under tail-coverts; feet reddish flesh-coloured; bill black; iris reddish pearl.

The female is barely distinguishable from the male, but is perhaps a little smaller.

The young in first plumage is altogether more ashy in colour, and shows no trace of the spotted black mantle, the under parts, especially on the abdomen, more buffish, with the vent and under tail-coverts white; feet dark flesh-pink; bill dark leaden grey; iris pale straw-yellow. Hab., Burma, the Malay Peninsula, Sunda Islands south of Timor, and the Moluccas probably in winter only.

In Hume's "Nests and Eggs of Indian Birds," Vol. II., pp. 356, 357, we read:—"Writing from Upper Pegu, Mr. Eugene Oates remarks that this bird is common everywhere except on the hills, where I did not meet with it. It seems to breed at all times of the year. Two eggs measure 1.21 by 0.88 each. They are, of course, pure white. The nest is generally placed low—*i.e.*, under 15 feet from the ground, in bamboo bushes or shrubs.'

"Again, writing from Wau, in Lower Pegu, he remarks:—'The nest of this bird is to be found all the year through. It is a common bird in the plains, but becomes rather rare in the various hill-tracts. The nest is built flimsily of fine twigs, so loosely put together that the eggs may be seen from below. It is generally placed in thick bamboo brakes at various heights, but most frequently at from 10 to 20 feet from the ground. Eggs invariably two in number. A good thick jujube-tree is often chosen by this bird for the purpose of nesting.'

"Two eggs sent me by Mr. Oates measure 1.2 by 0.88, and 1.22 by 0.77."

In all probability, like its near ally, the Indian "Spotted Dove," this bird breeds everywhere. It is admitted to be an easy species to breed in captivity.

In 1894 I bought a supposed pair of this bird and turned them into a garden aviary, where I soon discovered that both were cocks, one eventually killing the other. In 1897 I purchased a female, hung up a box with bran in it and a few twigs scattered over the top, and early in August I found a broken egg on the floor, probably dropped by *Zenaida auriculata*, a pair of which took turns with my pair of Necklaced Doves in hatching their eggs.

The first young one left the nest on August 28th, and, owing to a misunderstanding, was kept without food for the best part of the day; the second bird flew the following day, though not fully fledged. One of the young was killed by a Nicobar Pigeon on September the 9th, and the second died through catching cold on the 17th.

About the middle of September I fixed up a series of pigeon boxes, in one of which the hen again laid, and the pair incubated the eggs steadily, but they proved to be clear. In the following spring the cock died; the hen, however, lived some years later.

On the 13th February, 1900, I bought a reputed pair, which, however, were not only two cocks, but appear to have belonged to the next species, for when I sent them to the London Zoological Gardens some years later they were identified there as *T. suratensis*. The supposed male was constantly showing off to the supposed female, a slightly smaller bird, but naturally without result. The Doves seem to be singularly deficient in discernment, males frequently behaving to other males precisely as though they imagined them to be females. In many of them undoubtedly the colour differences are very slight, but one would imagine that the birds themselves would be able to see differences. The coo is usually a rattling "*Gwar, go,*" but sometimes it is trisyllabic—"*Who-hoo-hoo.*"

An abundantly imported species, first purchased by the Zoological Society in 1884

SPOTTED TURTLE-DOVE (*Turtur suratensis*).

Above brown; each feather of the upper back and scapulars with two pale vinous-isabelline terminal spots, expanding upon each side of the feather; wing-

coverts with only a blackish central streak; sides of lower back and rump tinged with leaden-grey; edge of wing and anterior wing-coverts grey; flights brown, the secondaries tinged with grey on outer web; central tail-feathers brown; next pair greyish-brown, third and fourth pairs grey with a blackish central belt and whitish tips, four outer pairs black with the terminal half white, tinged with grey on the fifth pair; head vinaceous, greyish on the forehead; feathers of nape and sides of neck bifurcated, black, each with two white spots; under-surface vinous, whitish on the throat, and fading into white on the vent and under tail-coverts; bill dull leaden-black; feet deep purplish-red; irides dark hazel (perhaps with reddish orbital ring). Female slightly smaller. Hab., "Yarkand, Afghanistan, Cashmere, through the Himalayas to Assam and Munipur, the whole of India, and Ceylon." (Salvadori.)

Col. Legge says ("Birds of Ceylon," Vol. II., pp. 706, 707): "Wherever there are trees surrounding, or encircled by, open places, this familiar little Dove is sure to be found. It delights in the bushy trees which here and there have been left standing in the cinnamon-gardens, and after it has satisfied its appetite on the grass-seeds which it finds in abundance in this locality, flies about from tree to tree, or takes up its perch on an outspreading branch and coos to its mate. When perched it is very wary, and scarcely ever lets one approach it within gun-shot; but when feeding in a newly-cut paddy-field, or about the native threshing-places (which it constantly frequents, even months after the grain has been gathered in), or on a road where it scrutinises the dried-up droppings of cattle or horses, or while elegantly tripping over some newly-burnt jungle-clearing (another favourite resort), it will not rise till approached within a moderate distance, when, taking a few hurried paces, it will fly off with a Pigeon-like clapping of its wings and settle down in the nearest inviting tree. In the interior every paddy-field, every clearing in the forest, and every cheena under cultivation has its attendant flock of Doves, which find abundant sustenance in the grain or grass-seeds of such resorts. Its coo is a plaintive note, not nearly so deep as that of the last species" (the Indian Collared Turtle). "It is, as Blyth remarks, difficult to express in writing, and he likens it to the syllables *oot-raow-oo-oot-raow-oo*.

"Its flight is swift and graceful; and during the breeding-season it indulges in sundry careerings on the wing, rising in the air and then circling down with outspread wings to its perch, these performances being apparently for the mutual gratification of the happy pair during the joyous time of their existence."

"They feed in the mornings until about 9 a.m., and then again in the afternoon, commencing about 3 o'clock, when they may generally be seen on the ground at the edges of woods, copses, and groves, or on native compounds often not far from the cottages.

"In the Western Province this Dove breeds from March until June, after which it no doubt lays again, for the eggs may be taken almost at any time of the year. I have found the nests in bushy umbrageous trees at about 10 or 15 ft. from the ground, generally situated near the end of the branch, also on low date-palms (a favourite situation), placed near the trunk at the origin of the frond. They are made of fine twigs neatly laid over one another, some of them interlaced so as at times to form a firmly-constructed fabric, in the centre of which there is a just perceptible hollow. The eggs are two in number, exact ovals, glossy, and pure white, measuring from 1.0 to 1.12 in. in length by from 0.8 to 0.15 in. in breadth."

Mr. P. W. Munn, writing on the birds of Calcutta (*The Ibis*, 1894, p. 55), says: "They probably breed all the year round, for I have taken eggs in January, February, March, April, June, August, October, and November, but by far the greater number in April; they will often lay again in the same nest from which the first clutch of eggs has been taken; and sometimes the old bird, on being disturbed from the nest, will sham lameness in order to draw the intruder away from it."

There is no doubt that dealers often sell this species as *T. tigrinus*, and therefore it is quite likely that the examples which I purchased as Necklaced Doves in 1900 may have belonged to this species (I had no living authenticated specimens of *T. tigrinus* to compare with them), and about 1906 or 1907 I sent them to Regent's Park. The London Zoological Society received a pair in 1874, and bred from them in 1877 and 1878.

Senegal Turtle-Dove (*Turtur senegalensis*).

The adult male has the head, neck, and breast vinous, with the centre of throat and chin paler; the abdomen, vent, and under tail-coverts white; flanks grey; a broad collar of rust-tipped notched black feathers encircling the front and sides of neck; back and scapulars lilacine chestnut; lower back, rump, upper wing-coverts, and secondaries leaden-grey; upper tail-coverts grey-brown; some of the inner wing-coverts and tertials with a chestnut tinge; bastard-wing and primary-coverts and primaries black, the latter with narrow pale margins; under wing-coverts and axillaries grey; central tail-feathers brownish-grey, the next two pairs leaden-grey, the remainder slate-black at base, getting gradually grey and then white at the extremity, the white being broadest on the outermost feathers and extending along the margin of the outer webs; tail below black at base, white on the terminal half; feet crimson; bill dull black, slightly tinged with vinous; iris orange-red. The female is slightly smaller and duller in colour than the male, but otherwise similar. Hab., all over Africa, the island of Socotra, the Canary group, and somewhat modified in Palestine. The North African birds are said to be somewhat larger, and have been named *T. egyptiacus*. Those from Egypt and Palestine are said to be intergrades from the Senegal to the true Cambayan Turtle (*T. cambayensis*).

This Dove is abundant in all cultivated districts, building and breeding not only in the trees and hedges which are planted in lanes and plantations, but in holes and on rafters, in ruins, walls, churches, and other suitable places in the midst of towns and villages.

As a rule, the species is seen in pairs or family parties, not in large flocks; it seems to breed almost throughout the year, both when wild and in captivity, the nest being formed of twigs and roots; the eggs are two in number, and white.

The coo of this Dove is not unlike that of the Half-collared Turtle or the rarer trisyllabic note of the Necklaced Dove—*Roo-hoo-hoo*. Like most Doves when nesting, this species becomes aggressive towards other members of the family, easily driving away more powerful birds by the vehemence of its attacks; it has frequently been bred at our London Zoological Gardens, and specimens liberated there bred in the Park in freedom.

This species is freely imported, but I never myself possessed it until the 6th August, 1902, when my

friend Mr. D. Seth-Smith gave me a male which is still living as I write in 1909.

It is not clear when this species was first acquired by the London Zoological Society, but it was bred in the Gardens at Regent's Park in 1861, 1862, 1863 and 1865, and many others in later years, the last recorded in the 9th edition of the "List of Animals" having been bred in 1892.

CAMBAYAN TURTLE-DOVE (*Turtur cambayensis*).

Differs from the preceding species in the absence of any reddish tinge from the upper parts, which are of a more uniform pale earthy brown colour; the rump is also never pure bluish, but uniform with the back, though more or less blue on the sides. Hab., "Constantinople, where probably it has been introduced, and Asia Minor, to Turkestan and Central India" (Salvadori).

Hume observes ("Nests and Eggs," Vol. II., p. 351 and 353):—"The Brown Turtle-Dove breeds pretty well all over the plains of India and in the outer ranges of the Himalayas to an elevation of 4,000 or 5,000 feet.

"The earliest nest I ever obtained was at Etawah on the 1st January, and the latest at Agra on the 2nd August; the first contained one, the second two fresh eggs.

"The nest is a very slight one, commonly placed in low trees or shrubs, often thorny ones, at no great height from the ground, but occasionally about the roofs or in niches of buildings. The nest is composed of thin twigs, grass-stems, and sometimes a root or two, but has no lining.

"They build at times in palms. I have found several nests of this species in the bristling crowns of young wild date-trees (*Phœnix sylvestris*).

"They have certainly two broods, and often, I think, three, in the same nest, successively.

"Two is the regular complement of eggs, but I have very often found only one incubated, or a single young bird in a nest.

"These eggs are, as usual, pure white and commonly very glossy. They vary comparatively little in shape, though a good deal in size, and are typically rather broad, nearly perfect ovals. Although in all this family the size of the egg varies greatly, those of this species are, as a body, smaller than those of *T. pulchrala*, *Chalcophaps indica*, and *T. euratensis*, but about the same size as those of *T. tranquebaricus*. They are a very pure white, seldom, if ever, exhibiting that creamy tinge typical of *T. tranquebaricus* and not uncommon in *T. risorius*.

"In length the eggs vary from 0.88 to 1.18, and in breadth from 0.75 to 0.9; but the average of forty eggs is 1.01 barely by 0.86 full."

Mr. T. H. Newman has possessed this species, and has recorded its period of incubation as fifteen days (cf. *The Avicultural Magazine*, Second Series, Vol. II., p. 211). The London Zoological Society acquired two specimens on June 11th, 1901.

The next two sub-families have been popularly known as Ground-Doves, but they are far more arboreal than terrestrial in their habits; only flying to the ground to feed as many other Doves do; therefore, in my little work, "How to Sex Cage-Birds," I proposed to treat them as aberrant Turtle-Doves and Metal-spotted Turtle-Doves, which I think is much better.

CHAPTER XVIII.

ABERRANT TURTLE-DOVES

(Sub-family Geopeliinæ).

In these birds the wings are rounded, the primaries not being much longer than the inner secondaries; the tail is rather long, and consists of from twelve to fourteen feathers; the tarsi are sealed in front. In captivity they may be treated in the same manner as Turtle-doves; they are far more quarrelsome.

BAR-SHOULDERED DOVE (*Geopelia humeralis*).

The adult bird has the forehead almost to the centre of the crown, the sides of the head, front of neck and breast bluish-ash, the chin and throat paler, almost white; the centre and back of crown to the nape greyish dusky brown, each feather with a pale subterminal and black terminal band; back of neck and mantle bright cinnamon, each feather with black tip; back, rump, upper tail-coverts, wing-coverts, inner secondaries, and tertiaries olivaceous, shading into greyish-brown, each feather with black terminal crescentic bar; primaries blackish-brown, the inner web widely chestnut excepting towards the extremity; secondaries olivaceous brown, the inner webs somewhat chestnut in tint; tail greyish brown in the centre, becoming gradually more and more chocolate and white tipped to the outermost feathers; hind breast and front of abdomen delicately washed lilac, becoming more cinnamon on the flanks where they overlap the bend of the wing; abdomen, vent, and under tail-coverts, white; sides of abdomen washed with greyish lilac; bill slaty bluish, paler towards the tip; feet flesh pink; naked skin round eye mealy lavender; iris ochre yellow. The female is slightly smaller than the male (but there is a good deal of variation in size in the males); her breast is of a darker and duller grey colour. Hab., Australia, excepting in the south-west, and in Southern New Guinea.

Gould says of this bird:—"As the structure of its legs would indicate, it passes much of its time on the ground, feeding on the seeds of various kinds of grasses and leguminous plants. Not only is it one of the most elegant of the Dove tribe inhabiting Australia, but it is also one of the most tame and docile, if I may judge from the few I observed on the heated plains of New South Wales. Their confidence was such that they sometimes perched within two yards of the spot where I was sitting. Extreme thirst and a scanty supply of water may, however, have rendered them more tame or bold than they otherwise would have been."

In its wild state this bird breeds in August, making a flimsy nest of thin twigs on the lower leaves of *Pandanus;* two white eggs are laid.

In December, 1896, I purchased a pair of this species, the female of which lived exactly a year, dying on the 8th December, 1897. In April, 1898, I purchased a supposed female—a bird decidedly smaller than my male—and turned the two into an aviary apart from other doves, as I found the cock Bar-shouldered Dove a perfect tyrant towards all other *Columbæ*. Gould states that the female is smaller than the male, but he should have said than some males, for it soon became evident, from the manner in which the larger bird tormented and plucked the smaller, that both were cocks; indeed, after I had separated them they would constantly call to each other, both cooing exactly alike—a song which

has a most impudent, conceited sound, *a-hooey, huchoo*, the *ch* sounded rather hard; indeed, the latter part of the call has been mistaken for that of a Cuckoo.

I tried my old cock bird with a hen Necklaced Dove, but had to remove her to save her life. I then placed him in my Weaver aviary for a year or two, and eventually turned out both cocks with a pair of Half-collared Turtle-Doves in a fowl-run, from which they finally escaped into the garden and were never recovered.

With a genuine pair in a good-sized garden aviary I should anticipate no difficulty in breeding this species. It was first purchased by the London Zoological Society in 1868, and was bred three times the same year, five young ones resulting from the three nests; two more were bred in the year following.

Peaceful Dove (*Geopelia tranquilla*).

Upper surface ashy-brown, each feather barred with black at the extremity; the bastard wing and primaries dark brown; shoulders below chestnut; the face and throat are grey; the breast, sides, and back of neck

Peaceful Dove.

grey, narrowly barred with black; abdomen and flanks vinous; the four central tail feathers ashy-brown; the remainder black, broadly tipped with white; the bill and orbits bright greyish-blue, the iris of the eye bright ash-grey; the legs greenish-grey in front, reddish flesh-coloured behind. The length of this bird is 8¾ inches. The female is smaller, less slender, and less alert than the male. Hab., Australia.

Mr. Gould says that this bird is "chiefly observed on the ground, feeding on the seeds of various plants under the shelter of thinly-timbered forests bordering plains." A local variety of the above—which only differs from it in size, being nearly a third smaller—is *Geopelia placida*, a small Dove abundantly and evenly distributed over the Cobang Peninsula and the neighbouring islands. Its favourite haunts, Mr. Gould says, are "moist meadows or the grassy banks of small streams"; it feeds principally on the seeds of grasses, and is seen "in flocks of from twenty to fifty, which, when disturbed, generally fly to the nearest tree. On alighting they jerk the tail very erect, and utter a slowly-repeated and monotonous double note; at other times they coo very faintly."

I think I purchased my first pair of this pretty little Dove in 1891, and I found them singularly dull in their behaviour; far from spending the greater part of their time on the ground, they never left a branch excepting to feed, and were by no means large eaters. In spite of their usually seeking for their food on the ground, the species of *Geopelia*, when kept in aviaries, spend more time in the branches cooing, bowing, and preening one another's feathers; at any rate, that is my experience of them.

A pair of Zebra Doves which I purchased in 1895 made things so uncomfortable for my first pair of Peaceful Doves that the cock died, and I had to remove the hen, which died in April, 1896; a second pair bought that year I put in the next aviary, where the cock lived until August, 1901, but the hen died earlier. I bought a third pair in 1896, and lost the hen in January, 1898. The hens of all these Doves seem more delicate than the cocks.

Being kept from first to last in indoor aviaries, none of these birds made any attempt to breed; but, in an outdoor aviary, I believe there is no difficulty in multiplying them.

This species actually is the most peaceful of its genus; as the name "Peaceful" has been applied to it, one naturally expected it to be one of the most vicious of all Doves, the names applied to birds being rarely descriptive either of their true characters or colours. If a bird is called "All-green," it is sure to have about half-a-dozen colours in its plumage; if it is spoken of as "Indigo," it is a combination of cobalt, ultramarine, and green; if it is said to be "Ultramarine," it is indigo, sometimes with a greenish tinge; if "Scarlet," it is sure to be vivid carmine, and so on; then, as I have pointed out more than once, the so-called Ground-birds are frequently far more arboreal than terrestrial; the reputed songsters (like the Melodious Finch) have the barest apology for a song—indeed, I don't consider that our Song-Thrush is a singer; it is rather a talker, and (though cheerful and bright) wearies one at times with its four-times repeated utterances.

The London Zoological Society acquired this Dove first in 1864, and recorded it in the "List" as *Geopelia placida*, distinguishing it from *G. tranquilla*, supposed to be first received four years later. It is a very freely imported bird, and used to be readily purchasable at about 5s. the pair.

Zebra Dove (*Geopelia striata*).

The general resemblance of this bird to the preceding is so great that it will, perhaps, be most useful to point out the chief distinctive features. The back of the crown is somewhat redder; the black and white bands crossing the neck only extend over the sides of the breast; the feet are vinous or purplish-red; the bill slaty-black, the iris brown. The female is smaller than the male, and shows less reddish tinting on the crown. Hab., Southern Tenasserim, the Malay Peninsula, and Indo-Malayan Archipelago; from the Philippines southward to Lombock, the Celebes, and Amboyna. It has been introduced into the Seychelles, Madagascar, Mauritius, Round Island, Réunion, and St. Helena.

Writing respecting the nests and eggs of Philippine birds (*The Ibis*, 1898, p. 246), Mr. Ogilvie Grant thus describes the egg of *G. striata*:—"Shape perfect oval. Pure glossy white. Measurements 27 mm. × 21 mm." Mr. J. Whitehead also describes the nidification as follows:—"This species nests in the lower growths of old forests, the frail nest of twigs being often placed among the hanging creepers. Generally two eggs are laid."

In *The Ibis* for 1899, p. 492, Mr. Whitehead says that this Dove "is often kept as a cage-bird throughout the Malay Islands." This species, unlike its near relative, *G. tranquilla*, is quarrelsome and spiteful. I purchased a pair in 1895, and after they had made them-

selves objectionable to their more placid relative, they were in turn attacked by my Steel-barred Doves (*C. picui*), the female being so badly plucked that she died on January 14th, 1901. The male, I suppose, died later, or else I gave it away; at any rate, I have no skin of this species.

According to the late Mr. Cresswell (*The Avicultural Magazine*, First Series, Vol. III., p. 205), young birds of this species are often reared up to the age of 16 to 20 days, when they jump out of the nest and dwindle away through neglect, or the dampness of the climate. However, he reared one, with some trouble, in 1897. It is not *Geopelia striata* only that ignores its young after they leave the nest; Doves in captivity, owing to the constant supply of food in an aviary, are very liable to this stupid trick.

Russ states that "In the birdroom they are more peaceful than several of their relatives. They nested in mine together with Passerine and Diamond Doves." This is very remarkable, because Passerine and Diamond Doves are both as a general rule fidgety and quarrelsome birds.

The Zebra Dove is one of the most abundantly imported of all the *Columbæ*, and, at times, can be obtained at a ridiculously low price. It first reached our Zoological Gardens in 1863, and bred there in 1865.

Mauge's Dove (*Geopelia maugei*).

Back and upper wing-coverts greyish-brown, with black edges to the feathers; flights brown, the primaries cinnamon on inner web, and with the outer web very narrowly edged with cinnamon-grey; four central tail-feathers greyish-brown, lateral feathers black, broadly tipped with white; front of head, cheeks, and throat grey; back of head pale brown; neck, breast, and sides with numerous narrow black and white bands, the pale bands on the hind neck greyish; under wing-coverts cinnamon; abdomen and under tail-coverts white; bill leaden-grey; feet ashy-blue, marked with violet; irides pale yellow. Female smaller and less slender in appearance than the male. Hab., "Timor, Flores, Sambawa, Wetter, Lettie; Tenimber Islands, Ké Islands, Koohr, and doubtfully Ternate." (Salvadori.)

Dr. Guillemard says ("Proceedings of the Zoological Society," 1885, p. 510) that this Dove is "extremely common round the town of Sumbawa." I have, however, not come across any notes on the wild life.

In 1867 the London Zoological Society purchased three examples of this species, and in 1868 a specimen was bred in the Gardens; in 1870 five examples were added by purchase; but Russ says: "It has not yet been offered for sale in our market."

Diamond Dove (*Geopelia cuneata*).

The cock bird has a delicate grey head, neck and breast, which fades into white on the belly and under tail-coverts; the back and shoulders are cinnamon-brown; the wing-coverts dark grey; each feather of the wing-coverts and scapularies has a white spot near the tip of each web, narrowly edged with black; the bastard wing and primaries are brown, the latter, with their inner webs, rufous for two-thirds of their length; the four central tail-feathers are grey, shading into black at their extremity, and with black shafts; the remaining tail-feathers are greyish-black at the base and pure white for the remainder of their length; the iris of the eye is either bright red surrounded by naked skin of the same colour, or greenish-yellow on a similarly-coloured ground; the bill is dark olive-brown; the legs, reddish flesh-colour or yellowish. The hen differs from the cock in its slightly inferior size, the browner tint of the back of the head, neck, and upper surface generally, and the larger white spots on the wings; the orbital ring is also a trifle narrower. Hab., Australia, with the exception of Cape York and Rockingham Bay. (Salvadori.)

Mr. Gould says of it: "I sometimes met with it in small flocks, but more often in pairs. It runs over the ground with a short bobbing motion of the tail, and while feeding is so remarkably tame as almost to admit of its being taken by the hand; and if forced to take wing it merely flies to the nearest tree, and there remains motionless among the branches. I not infrequently observed it close to the open doors of the huts of the stock-keepers of the interior, who, from its being so constantly before them, regard it with little interest. The nest is a frail but beautiful structure, formed of the stalks of a few flowering grasses, crossed and interwoven after the manner of the other Doves." It lays two white eggs. Mr. Gould describes its song as very plaintive; but at times he says that it utters a singular note which much resembles the distant crowing of a cock.

The coo of the cock bird sounds like "*Cho-choraw, cho-choraw,*" but that of the hen is shorter and softer, consisting of only two syllables. In colouring it is prettier than its peaceful relative, and its much smaller size renders it charming. In the breeding season, however, it is very spiteful towards its own kind.

I purchased two pairs of this species in 1896, which were constantly at war, or, rather, the two cock birds were, and the death of one of the hens increased the disaffection, so that from morning to night the stronger cock bird chased the weaker up and down the aviary, either in the air or on the ground. It was a pretty sight to watch these most active of the smaller Doves turning and twisting in the air, in the attempt the one to capture, the other to evade.

From time to time nesting was commenced and eggs were deposited, but I suppose the incessant quarrelling interfered with incubation, for no eggs were ever hatched. In 1899 the hen and later the weaker cock bird died, so that I was left with a solitary male. On Sept. 8, 1903, I purchased a third pair, and in 1907 turned them out into my larger garden aviary, where they went to nest five times, but only reared four young. The nests were the most ridiculous little apologies that I ever saw, consisting merely of a tiny pad of hay and fine twigs, about 3 or 4 in. in diameter. The marvel to me was that the eggs ever remained on it (they did not always). I had heard such wonderful tales about the absolute hardiness of this Dove that I left both old and young out-of-doors all the winter, and, in consequence, lost the cock bird and all the young. In 1908 I turned out the remaining cock; but that year only two young were reared, and one of these died about a month later. That year I brought the three Doves indoors before the winter. In 1909 I turned out the hen with one cock bird, but the latter was evidently her son; at any rate, she persecuted him continually, tearing out bunches of feathers and hunting him from pillar to post. On July 5th I found him dead.

Mr. Seth-Smith, who has bred many pairs of this Dove, told me that he thought several pairs together, in a fairly large garden aviary, did better than a single pair. Judging from his unvaried success, I should think this was the case. It has been freely bred by many aviculturists, mostly, I think, in the open; though the fact that in 1905 I twice bred single birds indoors, though they died when three days out of the nest, seems to indicate that breeding under cover may be possible; in fact, I suspect that in Germany most birds are bred in heated birdrooms. The London Zoological

Society acquired five examples of this species in 1868 and added two more in 1870, when they bred one young one, adding a second in the year following; in 1874 three more were purchased, and that year two pairs were bred and a third pair acquired by exchange. This seems to bear out Mr. Seth-Smith's view that breeding is more successful when several pairs are turned out together.

Scaly Dove (*Scardafella squamosa*).

Above greyish-brown with black edges to the feathers; upper wing-coverts pale brown, becoming white towards the tips and edged with black; bastard-wing and primary-coverts black; flights brown; primaries with the inner webs cinnamon tipped with brown; inner secondaries greyish-brown, with a narrow white edge to the outer web; two central tail feathers greyish-brown, the next two pairs brown at the base, but with black towards the tip, the three outer pairs black, with increasingly broad white tips; below white, with a pinkish tinge on the lower neck, sides and breast, each feather edged behind with black, excepting the under tail-coverts; under wing-coverts dark brown, edged with black; bill brownish-black; feet flesh-coloured; irides carmine-red. Female rather duller in colouring; and, I think, with the black edgings to the feathers less strongly defined. Hab., Brazil, Venezuela, and Colombia.

Burmeister observes ("Systematische Uebersicht," Vol. II., p. 299): "I only once found this graceful Dove, in a little flock near the Fazenda of Caraucas in Minas Geraes; the individuals were always together in pairs, but so shy that we could only get a shot at them by exercising the greatest caution."

Mr. W. A. Forbes says (*The Ibis*, 1881, p. 356): "I first met with this pretty Dove in some of the gardens in the outskirts of Parahyba. Afterwards, when riding between Macuca and Garanhuns, I several times flushed little coveys of it, which rose up from the road and took refuge in the nearest tree. Usually these parties consisted of about four. When rising they make, apparently with their wings, a curious rattling noise, whence they are called by the Brazilians 'Rôla Cascavel,' *Cascavel* meaning a rattle, and being also the name applied by the natives to the Brazilian rattlesnake (*Crotalus horridus*), which is by no means rare in the district."

I have found no account of the nidification of this species in a wild state, but in 1903 Mr. Seth-Smith procured a pair of the species from a consignment received by Mr. Thorpe, of Hull, and in 1904 he successfully bred a specimen. A full account of Mr. Seth-Smith's experience is published in *The Avicultural Magazine*, Second Series, Vol. II., pp. 278, 279.

Russ says that he was the first to breed this species, and on several occasions; "at the nesting season, in April the male calls the female morning and evening rukukuh; the female then settles on any kind of shrub or on the upper surface of a Hartz nesting-cage, spreads out her tail like a fan, bends her head low down, and coos softly. The male carries up all kinds of twigs, fibres, threads and strips of paper, and the female constructs therefrom a careless nest. With Mr. Langheinz, the dentist, they went to nest several times, but invariably without result, because the nest and eggs were every time torn down by clinging to the bird as it flew."

This Dove was first acquired by the London Zoological Society in 1867.

METAL-SPOTTED DOVES.
(Sub-family Peristerinæ.)

These small Doves, which I have characterised as "metal-spotted," have twelve tail-feathers, and, as a general rule, their primaries are not much longer than the secondaries. Although the structural distinctions between them and the *Geopeliinæ* do not seem very striking, they appear to be a natural group; they are about the most quarrelsome of all the Doves, and being very courageous are apt to make themselves very objectionable to Pigeons of nearly twice their length and ten or twelve times their bulk.*

Steel-barred Dove (*Columbula picui*).

Adult male above brownish ash, the forehead nearly white, the crown grey; beneath, pale vinaceous brownish; the chin, throat, and centre of abdomen white; from the upper mandible to the eye is a straight dusky line, almost black; outer upper wing-coverts and

Steel-Barred Dove (*Columbula picui*).

inner secondaries with white borders to the outer webs; outer lesser wing-coverts barred near their extremities with steel-blue, forming a straight bar across the wing; quills, primary coverts, bastard wing, and under wing-coverts, black; two central tail-feathers like the back, the succeeding ones more slaty and longitudinally streaked, and bordered towards the tips with brownish and white; then two white feathers on each side washed, excepting towards the tips, with grey on the inner webs, and with a tapering, slaty grey border to the outer webs; outer feathers, white; feet, lake-red; bill, ashy at base of culmen, otherwise pale bluish at base and slaty-black on the apical half; iris, claret-coloured.

The female is a little duller and distinctly browner above, the breast also is browner. Hab., S. Brazil, Paraguay, Argentina, Chili, and Bolivia.

In its wild state this bird is usually seen in pairs, although occasionally from a dozen to a score may be seen in one flock. According to Hudson, its notes are rather loud and somewhat monotonous. In captivity they either consist of a prolonged rattling coo, or are just audible and more like a subdued moan than a coo. The nest is quite normal, and the eggs, two in number, are small, white, and rather short and hardly oval. In their native haunts these tiny Doves breed two or three times in the season, the last brood being sometimes

* Like other tiny Doves, the *Peristerinæ* do well upon white millet and canaryseed only.

produced as late as May. I have had eggs laid by a crippled hen in my bird-room during the same month.

I purchased my first pair of this species in December, 1896, but could not keep them together as the hen had a drooping wing and flew with difficulty, so that she was at the mercy of my Bleeding-heart Pigeons, which would have killed her had I not removed her from that aviary. In January, 1900, I purchased two more pairs, of which one female died two or three days afterwards, although no cause of death could be discovered. I was thus able to identify the bird with certainty. Later on a cock bird died in good condition.

Writing to the late Mr. Cresswell, he informed me that his experience of these so-called Picui Doves was that they died suddenly and unaccountably; oddly enough, my original pair survived until about 1903. I then lost the hen, and bought two more, which proved to be cocks. These three birds were always at war; two of them set upon the third and literally skinned it, so that it died; the others I sent away (I think to the Zoological Gardens).

The London Zoological Society first purchased three examples of *C. picui* in 1883, and in the following year two others were deposited at the Gardens. Miss Alderson, who had six examples of the species, speaks of it as "seldom imported," but when I purchased my first pair in 1896 there were, I believe, plenty in the market, and they were offered at a cheap rate; if I remember rightly the price did not exceed 10s. a pair, and I rather think I got them at about half that price. As Miss Alderson says, the females are undoubtedly delicate, far more so than the males.

Passerine Dove (*Chamæpelia passerina*).

The adult male has the forehead, sides of head and neck, breast and abdomen vinous; crown and nape bluish-grey with dark edges to the feathers; this is also the case with the feathers at the sides of the neck; upper wing-coverts vinous; flights cinnamon, bordered externally and tipped with dull brown; the inner secondaries and outer greater wing-coverts chiefly of this colour; the wing blotched with steel-blue shading into violet; remainder of upper surface olive-brown; the lateral tail-feathers greyish at base, black at extremities, the outermost tipped with white; feathers of lower throat and front of breast with dusky centres; middle of abdomen and base of under tail-coverts whitish, the longer coverts dusky; feet flesh-coloured; bill orange with dark brown tips; iris purple, eyelids pale ochreous.

The female is browner, showing little or no vinous tinting; the young are still duller, but the upper parts are barred with white at the ends of the feathers. Hab., South Atlantic and Gulf States, Texas, New Mexico, Arizona, California, the West Indies, Central America, and South America, as far as Peru and Paraguay. The most brilliantly coloured examples are said to occur in the Socorro Islands and Jamaica.

The above description and list of localities are taken from Count Salvadori's, with the exception of the soft parts, which I took from a female specimen which I purchased in 1899, the male of which is still living as I write (more than ten years later). I am not at all sure that the Count is correct in regarding all the local forms as mere sports of one variable species. Not only is there little doubt that the colouring of the soft parts differs locally, but in the two females of which I have preserved skins the plumage differs remarkably, one being reddish-brown above, the forehead, chin, and throat chalky-whitish; pure white at centre of throat; the breast-feathers small, mostly pearl-grey (a few only blackish), with white to greyish-white borders; the other olive-brown above, the front of crown and forehead greyer, the chin and throat browner, and with delicate brown edges to the feathers; the breast altogether browner, much more coarsely feathered, many of the feathers being blackish with brownish-white borders; this bird also is distinctly larger.

In *The Ibis* for 1908, pp. 107-115, Mr. P. R. Lowe has written a very instructive paper upon the various named forms of Passerine Doves, in which he appears to regard all as species.

In *C. portoricensis* the bill has the base crimson for two-thirds of its length, and the tip brownish-black to black; the iris varies from hazel to light stone-yellow, according to sex and age, and there is a narrow stone-yellow edging to the eyelids.

In *C. axantha*, from Cuba, the bill is blackish, black at tip, with only a faint wash of dull crimson at the extreme base; tomium narrowly pale crimson.

In *C. bahamensis* the bill is constantly and wholly black.

In *C. terrestris*, from Florida, the base of the bill is bright orange, the nasal prominences clear yellow, and the tip of the bill horn-coloured.

In *C. jamaicensis*, the typical Passerine Dove, which is strongly vinaceous on the under parts, the basal two-thirds of the bill varies in the male from bright orange to yellow, according to age; in the female it is yellow, and the tip varies from brownish-black to black.

In *C. pallescens*, from the South-Western United States, the bill is red at the base, and the plumage is pale.

C. socorroensis, from the Socorro Islands, is not differentiated in Mr. Lowe's paper.

In *C. bermudiana* the irides are light hazel, with an inner ring of yellowish; the eyelids edged with a narrow ring of light yellow; the bill is black or dark horn-colour, the nasal prominences dull horn-colour, and the edges of the mandibles narrowly light crimson.

In *C. insularis*, from the Cayman Islands (which nearly approaches *C. bahamensis*), the basal half (or more) of the bill is distinctly orange or yellowish.

In *C. perpallida*, from Curaçoa, Bonaire, Aruba, Blanquilla, the Los Hermanos group, and Margarita, the basal two-thirds of the bill vary from orange and orange-yellow to yellow (according to age), the tip being nearly black; the iris is reddish. Females have no orange at the base of the bill.

In *C. exigua*, from Mona Island, Puerto Rico, West Indies, the bill is wholly black; it is smaller than *C. bahamensis*, and much paler above and below.

I cannot say whether my first female with purple irides and pale ochreous eyelids was the Florida bird, or what it was; it is not likely to have come from Jamaica, to judge by the almost entire absence of vinaceous colouring in the plumage and the fact that the true *C. passerina* is described by Dr. Robinson (Gosse's "Jamaica") as having a ring of yellow, then one of black, a narrower black ring, and then a broader yellow ring in the iris. However, as it is better to deal with typical *C. passerina*, I quote the following notes on the habits from Gosse's "Birds of Jamaica," pp. 311-313:—"In pairs or small companies of three or four, it frequents pastures, on the short turf of which it runs with considerable speed, and is rather loath to take wing, often allowing a person to approach within a few yards. If one fly, however, all fly, but seldom go far, alighting either on the ground again or on some neighbouring tree of small elevation.

As it runs along the tail is usually erected, which gives it the aspect of a miniature fowl.

"I have found the craw full of small seeds of grasses; they also eat the seeds of the *Iatropha*, and of the castor-oil plant, and particularly those of the gamboge thistle (*Argemone*), so common in pastures. They are fond of picking about the beds of shallots and escalions for minute seeds exposed in the newly turned earth. They are, therefore, readily taken in springes made of horse-hair. They are more commonly caught by the neck than by the feet, and not seldom, as I am assured, is the neck quite cut off, though I presume the springe in such cases must be of stronger material.

"The Ground-dove is numerous all the year round. In March I observed it particualrly abundant on the banks of the Rio Cobre especially on a flat gravelly bed, partially surrounded by the bending stream near Spanish Town. . . ."

Mr. Gosse gives no account of the nidification, but J. G. Cooper, in his "Ornithoolgy of California," p. 517, says of the Florida form:—"I found their nests there, both on the ground and in trees, built like those of the Common Dove, and with two white eggs. They are in miniature very similar, both in appearance and habits, to the Common Pigeon, and are often kept in cages—mostly to fatten for food."

I purchased a pair of this pretty little Dove on July 10, 1899, but the female, unhappily, died egg-bound (having paired with a Picui or Steel-barred Dove) on Dec. 28. I purchased a second female about February, 1900, and turned her into a large cage with the male bird, which constantly quivered its wings and showed her great attention, trying his utmost to induce her to nest in a Canary nest-box containing the shed foliage from a pine which he carried into the box; she did not, however, lay. Finding an egg of a Steel-barred Dove in my bird-room, I placed it in the nest-box, and the pair incubated it steadily, but without result. Later on I substituted a small saucer-shaped woven nest given to me by Mr. Abrahams, and after a time the birds adopted this, but did not sit steadily. The hen died in December. I secured a third female by exchange early in March, 1902, and on the 27th of the same month it died egg-bound. Subsequently the male tried to pair with a hen Zebra-finch and made its life so miserable that I took the little torment out and put it into an aviary with my Bronze-winged Pigeons. From that time to the present it has persecuted the hen with its attentions.

There is usually not much trouble in inducing this tiny Dove to breed in captivity; provided that the hen does not become egg-bound, it is probably only a matter of time.

It is funny to watch these birds on the ground, as they often run with the tail standing quite upright; their ordinary note is a soft *hoo, hoo;* but Russ says they have also a loud call which sounds like *heho!*

This Dove first reached the Gardens at Regent's Park in 1860.

Pigmy Dove (*Chamæpelia minuta*).

Back greyish-brown; upper tail-coverts ashy; upper wing-coverts greyish-vinous; the inner ones with some steel-blue blotches; bastard-wing and primary-coverts black; outer webs and tips of flights dusky black, inner webs cinnamon; two central tail-feathers greyish-brown; lateral feathers grey with a subterminal black belt; outer feathers edged with white at the tips; crown and nape ashy; back of head with a brown tinge; forehead slightly vinous; throat, breast, and abdomen vinaceous; lower abdomen whitish-grey; under tail-coverts grey with white edges; under wing-coverts and axillaries cinnamon; bill brown; feet flesh-coloured; irides violaceous red. Female above pale greyish-brown tinged with olive; forehead paler; greater upper wing-coverts edged with white; throat and abdomen whitish; breast and flanks pale greyish-brown; under tail-coverts pale buff with dusky grey centres; central tail-feathers rather browner, otherwise the plumage is as in the male. Hab., Southern Mexico and Central America to Guiana, Brazil, Paraguay, and Peru.

I have found no field-notes relating to this little Dove; in 1899 it was noted as offered for sale in France, and in 1900 the Rev. Hubert D. Astley stated his belief that he had secured a pair. In July, 1906, Mr. E. W. Harper presented a specimen to the London Zoological Society.

Cinnamon or Talpacoti Dove (*Chamæpelia talpacoti*).

General colour brownish-vinaceous-red, becoming nearly white on the breast; top of head and nape grey, paler on the forehead; several steel-blue-black blotches on the inner wing-coverts, scapulars, and inner secondaries; bastard-wing, primary-coverts, and flights brownish-black; central tail-feathers brownish-vinaceous-red; lateral feathers brownish-red towards the base, black towards the tips, the outer feathers edged with pale reddish on outer web towards the tips; axillaries and under wing-coverts black; bill dark brown; feet flesh-coloured; irides dull yellowish-red. Female paler and duller, the mantle tinged with brownish; some specimens very slightly tinged with vinous, but tinged with brownish-grey, the middle of the abdomen being whitish and the under tail-coverts dull rufous edged with whitish. Hab., Venezuela, Guiana, Brazil, Paraguay, Bolivia, and Peru.

Burmeister says ("Systematische Uebersicht," Vol. II., p. 297): "Everywhere common in the whole of Brazil, even in the villages and towns; runs on the ground and comes into the highway of the suburb of Rio de Janeiro."

Mr. W. A. Forbes (*The Ibis*, 1881, p. 357) says:—"The Rôla, as this little pigeon is called by the Brazilians, is a very common bird all over the parts I visited. It is found solitarily or in pairs, and is much esteemed for the pot, and persecuted in consequence."

Mr. E. W. White ("Proceedings of the Zoological Society," 1882, p. 626) observes:—"These pretty chocolate-coloured Doves fly in pairs, and at this date were found constructing their nests in the orange groves; they are sometimes seen on the ground busily in quest of seeds, but are very wild and not at all common."

Four examples of this little Dove were purchased by the London Zoological Society in 1868, and a pair of young ones was bred in the Gardens the same year; in 1873 three more were purchased, and in 1877 two more, a pair being again bred that year and three the year following. Mr. Castle-Sloane reared three broods in his aviary in 1903 and 1904; he says that incubation lasts sixteen days.

Ashy Dove (*Peristera cinerea*).

General colour bluish-grey, paler on under-parts; forehead and throat nearly white; lesser and median upper wing-coverts, some of the innermost greater coverts, outer scapulars and inner secondaries with roundish or quadrate blue-black spots on outer webs; bastard-wing, primary-coverts, and flights black, the secondaries with their edges in part narrowly grey; lateral tail-feathers black, but the inner ones above greyish towards base;

bill yellow; feet red; irides with an inner red ring and an outer yellow one.* Female above brown, almost cinnamon on upper tail-coverts; paler on forehead; spots on upper wing-coverts and inner secondaries brownish cinnamon, the larger ones on the median and greater coverts with a pale posterior edging; central tail-feathers brownish cinnamon; lateral feathers black, the inner ones tinged and the outer pair edged with rufous on outer web; throat whitish; lower fore neck and breast pale brown shading into grey on remainder of under surface; under tail-coverts greyish-cinnamon, under wing-coverts grey. Hab., Southern Mexico, Central and Southern America, southward to Paraguay and Peru.

T. K. Salmon says of this Dove ("Proceedings of the Zoological Society," 1879, p. 544):—"Iris dark. Seeds in stomach. The nest is made of small twigs, and is exceedingly small and slight; it is placed on the outside boughs of low bushes."

Stolzmann observes (Taczanowski's "Ornithologie du Pérou," Vol. III., p. 253): "It keeps in the bushes at the margins of the rivers, in pairs or little coveys. At Palmal one found it more frequently in the rice-fields and never in the depths of the forest."

Mr. Walter Goodfellow, in his notes on the Birds of Ecuador (*The Avicultural Magazine*, First Series, Vol. VI., p. 269) says:—"At Santo Domingo we obtained some of the exceedingly pretty little pale grey *Peristera cinerea*. They were always in pairs, running about the paths near the huts, and they had a slight peculiarity in their habits, which I have not noticed in other Doves. When alarmed, instead of taking flight as most Doves do, they remained immovable, skulking as near to the ground as possible. At times, when they must have seen my approach long before I got to them, and had plenty of time to clear off, although I had not noticed them, they startled me by dashing up almost from under my feet."

This species reached the Amsterdam Zoological Gardens in 1857, the London Gardens in 1886, and a pair arrived at the Berlin Gardens in 1893; the German chemist Landauer and the dentist Langheinz each possessed a pair for more than two years, but neither succeeded in breeding the species, but the latter gentleman observed that this Dove was quiet and peaceable in the bird-room: if this is always the case it should be a far more satisfactory bird to keep than most of its family.

Geoffroy's Dove (*Peristera geoffroyi*).

The adult male above is bluish grey, nearly white on the forehead; the wing coverts crossed by three oblique bands edged with blue-black, that on the lesser coverts blue, the two others on the median and greater coverts purplish chestnut; these bands are edged behind with pale grey; bastard wing and primary coverts black; flights brown with pale margins; all the tail feathers excepting the central pair with white tips increasing outwardly in depth; throat whitish; breast grey; abdomen, vent, and under tail-coverts pure white; under wing coverts black; feet blood red; bill blackish; iris deep brown with orange outer ring.

The female and young are reddish brown, paler on the forehead; the wings browner than in the male, the two outer bands chestnut edged behind with fawn colour; the flights with reddish margins; all the tail feathers, excepting the central pair, greyish at base, black in the middle, and reddish-fawn towards their extremities; the throat and abdomen pale reddish brown, the breast deeper; the vent and under tail-coverts fawn coloured. Hab., S.E. Brazil.

Tolerably abundant in New Freiburg, where it feeds not only upon seeds but upon fleshy fruits, according to Burmeister. Stolzmann met with this Dove in the valley of Huayabamba, at 5,400 feet elevation. He says (Taczanowski's "Ornithologie du Pérou," Vol. III., p. 251):—"I have met with this Dove many times on the margins of the temporary lakes, in little companies or in pairs. It is stated that it is much more numerous at the period of the drying up of these water reservoirs, where a certain spring plant shoots up. The natives have given it the name of *Palamita-azal* = little blue Dove."

I have discovered no other notes dealing with the wild life, but there is no doubt that the nest of this bird consists of a platform of twigs, and that the eggs are white and two in number.

The London Zoological Society purchased a pair of this Dove in 1874; in 1876 three males and two females were added; in the same year four young ones were bred from three nests; in 1877 five young were bred, and in 1878 six more; others were added and bred in later years. Russ says that it is very rare in the German market.

Black-winged Dove (*Metriopelia melanoptera*).

Above greyish-brown, changing to grey on the edges of the outer upper wing-coverts, and into white on the bend and front edge of the wing; bastard-wing, primary-coverts, and flights black, inner secondaries greyish-brown; central tail feathers greyish-black; lateral feathers black, becoming grey towards the base; sides of neck and under-parts pale vinous; flanks grey; under tail-coverts dark grey, the longest ones nearly black; inner under wing-coverts black, outer ones white; bill black; feet brown, with the toes nearly black; iris silvery whitish; a naked primrose-coloured loral spot; according to Stolzmann the iris is dark brown, and according to Taczanowski the naked orbital skin is milky orange behind and below, with flesh-coloured papillæ, in front and above with black papillæ. Female without the vinous tinge on the under-parts, which are greyish-brown, becoming nearly white on the chin and middle of abdomen. Hab., "Western South America, from Ecuador to Chili, and also on the Argentine side of the Cordilleras." (Salvadori.)

According to Burmeister this Dove "is found in the high valleys of the Cordilleras on the Argentine side, from 6,000 ft. to 12,000 ft. in altitude, and, along with *Phrygilus fruticeti*, is one of the birds seen at the greatest altitudes by the traveller over the passes of the Andes." (Cf. Sclater and Hudson, "Argentine Ornithology," Vol. II., p. 142.)

Mr. Ambrose A. Lane says (*The Ibis*, 1897, p. 298):—"This Dove occurs at Huasco, Sacaya, and other localities in Tarapacá. I only observed it between 8,000 ft. and 12,000 ft. On first going to Huasco, in January, I noticed one or two flocks of upwards of a dozen on the sierras, but subsequently I met with only odd pairs, and they were scarce."

Mr. Walter Goodfellow says (*The Ibis*, 1902, p. 227):—"Numerous near Cotopaxi, at about 13,500 ft., among the rocks and lava. As nothing but a few tufts of coarse grass grew there, it was difficult to imagine what they could find to eat. The stomachs of two that we shot were quite empty. In life they have a primrose spot in front of the eye."

The Zoological Society of London purchased eight specimens of this strikingly coloured Dove in 1870, but the species does not appear to have bred there. As

* Mr. W. Goodfellow (*The Ibis*, 1902, p. 228) says:—"Beak greyish-green, with yellowish tip; iris red; feet flesh-coloured."

travellers do not appear to have described the nidification of this Dove, it would be all the more interesting to breed it in captivity.

With this species we come to the end of those sub-families regarded as nearest to the Turtle-doves, although, as I have already stated, *Leptoptila* not only has a general look of some of them, but takes more notice of them itself than of other Doves (as though itself claiming some kinship). On the other hand, the *Phabinæ*, which Count Salvadori places next in his classification, strike one as utterly dissimilar from the *Peristerinæ*, unless it be simply on account of the more or less metallic spots on the wings. Personally I should have felt happier if the *Phabinæ* had been placed between the *Geotrygoninæ* and *Calœnadinæ*.

CHAPTER XIX.

BRONZE-WINGED PIGEONS

(Sub-family Phabinæ).

These are somewhat stoutly built Doves, with spots and patches on the wings, which are generally more or less metallic; but it is not clear from Salvadori's catalogue how they are structurally distinguished from other sub-families of the *Peristeridæ*. They are all Old World types, but differ from one another considerably in their bulk, plumage, notes, and disposition. The smallest forms feed chiefly on millet, or millet and dari, the larger ones on millet, dari, hemp, smooth caterpillars, insects, and earthworms; the largest will also accept wheat and maize, though they do very well without it.

Harlequin or Cape Dove (*Œna capensis*).

The adult male has the anterior half of the head, including the chin, throat, and centre of breast in front, covered by a black mask bordered behind by a diffused white band; remainder of body above and two central tail-feathers olivaceous brown, the outer tail-coverts and these tail-feathers tipped with black; two black belts, with a broad pale sandy greyish belt between them across the rump; the lateral tail-feathers bluish ash with a broad subterminal black belt; the two outside feathers with the outer web, from the base to the belt, pure white; wing-coverts whitish ash, the scapularies indistinctly barred with olive-brownish; the inner-coverts with large blue-black patches; primaries bright mahogany-red with the greater part of the outer webs and the tips black; secondaries pearl-grey, dusky internally, the innermost feathers sandy brown; breast and abdomen white; under tail-coverts blackish towards the centre; primary coverts and primaries below mahogany-red, tipped and partly bordered with black, secondaries and tail below mostly black, the two outside tail feathers with a white outer stripe as above, feet deep flesh red, bill crimson towards the base, orange towards the tip; iris, chestnut-brown.

The female differs from the male in having the facial mask almost white; the ear-coverts, sides, and front of neck and crop pale ashy brown.

The young nearly resemble the female, but the crown and neck are banded with blackish; the wing-coverts are greyish-brown, banded with blackish and with buff-whitish terminal spots, feet deep purplish, bill black.

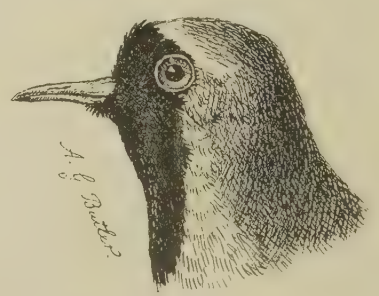
Hab., Tropical and Southern Africa, Madagascar, also near Jeddah and Aden, in Arabia.

This is a strange-looking bird, the head, when viewed in profile, being almost square, or, as only the two upper angles are distinguishable, perhaps one ought to say that the crown is flattish and truncated.

In Northern Africa this confiding little bird is met with, not only on wooded steppes, but round farm buildings, hedges, and gardens. It nests from June to September, when it is seen in pairs, but at other times in small flocks. The nest is placed in palms, Parkinsonias, and acacias, being formed of a few dry twigs. During the breeding season the males are quarrelsome.

The flight of this Dove is rather weak and undulating, but graceful. In its wild state it spends much of its time on the earth, but in captivity it sits nearly all day stupidly upon a branch, only flying down at regular times to feed. The cry sounds like *Hoo-roo-roo*, the tail being spread and jerked upwards at the same time.

Messrs. Stark and Sclater ("Birds of South Africa," Vol. IV., p. 177) says:—"The Namaqua Dove is a most abundant and familiar bird in the interior of the country, and is generally to be seen in the neighbour-



Head of Cape Dove.

hood of farmhouses, probably because food and water are to be found in the vicinity.

"From the dates of collection it appears to be probable that this Dove is only a summer migrant to the greater part of the country, though apparently resident in German territory and the Western Transvaal. It is a purely ground-feeding bird and runs very rapidly, so that it was frequently mistaken by Layard for a rat! It feeds entirely on grain and grass seeds, and has a deep plaintive 'coo.' The males will coquet with any female they meet, and are described by Layard as very salacious. The nest is usually placed in a mimosa, not very high above the ground, sometimes, however, on the ground or in a hole. It is the usual carelessly built loose platform of the Family, made of sticks and fibrous roots. The clutch consists of two oval eggs equally rounded at both ends. These are white, rosy tinted when fresh, owing to the yolk shining through the fine smooth shell. When blown they have a slight greenish tinge. They measure .08 × .60."

The Cape Dove is irregularly but somewhat abundantly imported; only, unfortunately, very few females seem to be sent home, so that I have never been able to obtain that sex.

I purchased two cocks in 1895, one of which died the following year. When too weak to stand it rolled over on its back, and my Zebra Finches had plucked all the feathers from its under parts when I discovered it. The second bird died early in 1897, so that I only had two

years' experience of this species in captivity. It struck me as, without exception, the dullest and least interesting Dove I ever had. Doubtless if I could have obtained a hen things would have been livelier.

Although this bird has been bred in Germany, Dr. Russ considers it a difficult bird to rear, as the brood is especially likely to be lost through misadventure. He, however, had a pair which nested on the floor behind a large cage, and brought up the young.

The London Zoological Society first purchased eight specimens of this Dove in 1856, and has had many others since that date. Writing in 1903, Miss Alderson says:—"I have never been successful in breeding this Dove, though my hens have laid eggs."

Tambourine Dove (*Tympanistria tympanistria*).

The adult male is brownish-grey above; the forehead, eyebrow stripes, cheeks, and under surface pure white; the lores dark brown; two broad dark brown belts across the rump, with a pale greyish-brown belt between them; a similar indistinct band bordering the second dark belt; inner wing-coverts and secondaries spotted with very dark green or purple; primary-coverts and primaries cinnamon, the outer webs and tips dark brown; six central tail feathers deep reddish-brown, the outer three on each side shading into grey and having a black subterminal belt; under wing-coverts and axillaries cinnamon; lower flanks washed with brown; tail below brown, with indistinct subterminal belt; the central feathers with pale brown tips, the outer ones with grey tips; feet dull crimson; bill dark purplish; iris hazel to dark brown.

The female has the forehead, cheeks, and under surface somewhat greyish, and the wing spots blackish without metallic shading.

I described the young at nine days old as follows (*The Avicultural Magazine*, Second Series, Vol II., p. 101):—"The skin, where not feathered, is of an ash-grey colour, the crown of the head sparsely covered with straggling sandy-coloured hairs, the neck and sides of breast below clothed with half-developed whity-brown downy feathers, those of the breast with broad, ill-defined subterminal blackish transverse bands; the flanking feathers of the abdomen are also downy, but pure white; all the feathers of the wings and tail are of a bright coffee-brown colour, with broad sub-terminal irregular transverse black bands; the bill is black with bone yellowish tip; the feet dark horn-brown, becoming almost black on the toes; the claws reddish-horn colour."

In 1906 (*The Avicultural Magazine*, Vol. IV., p. 309) I described the young at nineteen days of age, thus:—"Colouring of upper parts largely bronze-brown, but the feathers barred with buff and black; flights reddish-chestnut; tail chiefly vinous brown, the outermost feathers white. Forehead and broad eyebrow streak buff; the feathers at sides of crown standing in curved rows so as to produce a sort of divided crest, buff-brownish; ear-coverts and cheeks leaden-grey, the former apparently narrowly barred white and buff, but this appearance is probably partly due to the sheaths still remaining on the feathers at this part of the head; sides of neck, throat and breast buffish-brown, with narrow blackish bars; abdomen white; bill dull black; feet dark leaden-grey, with a faint sub-tint of flesh colour; the eye was too sunken to describe." Hab., South Africa generally; on the west coast northward to Casamanca, and on the east to Mombas; also Madagascar, the Comoro Islands, and Fernando Po.

Messrs. Stark and Sclater say of this Dove ("Birds of South Africa," Vol. IV., pp. 179, 180):—"The Tambourine Dove is only met with in thickly wooded districts, such as are usually found near the coast. It derives its name from its note 'coo coo,' repeated slowly at first and afterwards more quickly, till finally it ends in a more or less prolonged rattle resembling that of a tambourine. Its note is often heard in the middle of the day, when other birds are silent. According to Ayres it is seen in pairs or singly, but not in companies. It is very active and lively, of rapid flight, and feeds on the seeds of trees which have dropped on the ground, the principal one being that of the castor oil plant.

"The nest is built in a low tree, and consists of the usual rough platform of sticks, on which are laid two yellowish-white eggs.

"A clutch of two, taken by Mr. A. D. Millar, on Dec. 10, at Umgeni, near Durban, and presented by him to the South African Museum, are oval, smooth, and ivory-white, measuring .95 × .75."

After 1883 this Dove was imported freely for a time, and then again it disappeared from the market. A pair was brought home by Lieut. Horsbough in 1899 and given to my friend Mr. James Housden, of Sydenham, on condition that if they bred I should have the first pair of youngsters; unluckily for me, they did not breed, and so for a time I was without this charming species. However, Mr. T. L. Bonstow, noting in the second part of my "Foreign Bird-Keeping" that I had never possessed it, brought home a pair (together with a female Emerald Dove) and gave them to me in August, 1902.

Up to November, 1903, although many eggs were laid by my hen *Tympanistria*, none were hatched either in the bird-room or my larger garden aviary; then one young one was hatched in the bird-room and fed until nine days old, when its parents deserted it.

After 1903 and up to 1906 no eggs were hatched by these birds; therefore, as I desired to give them every opportunity, I again turned them out in the spring of 1906 into my lower though longer outdoor aviary, having previously moulded a sort of shallow basin of slender branches and twigs, at about 4 ft. from the cement floor, in the thicket of dead branches which partly fills the more remote covered part of the aviary.

The birds were turned out on May 3 and eggs were laid in the nesting site which I had prepared on June 6 and 8, the birds beginning to sit on the 8th, the cock turning the hen off the nest and taking her place at 9.30 a.m. and the hen returning to the nest at about 2.45 p.m.

On June 20 I found the first half-shell on the floor, and on the following day the second half-shell was brought out, there being just a day between the hatching of the two young birds. That *Tympanistria* should have hatched out on this occasion on the thirteenth morning, whereas in the considerably cooler bird-room the egg hatched in 1903 took four days longer to incubate, was to me a matter of great interest.

Of the two birds hatched, one fell out of the nest and evidently injured itself, as it died on July 9; the other (a cock bird) was successfully reared. The parents went to nest again, and reared two young ones until they left the nest, when they neglected to feed them, so that both died. In 1907 they again nested twice, but only fed one of the four youngsters which left the nest; this proved to be a hen. In 1908 they nested three times, but again behaved as before, so that one hen only was reared. In 1909 the weather was so unfavourable that the first nest appears to have come to

grief and a second pair of eggs, which I found dried up, were not fertile; therefore no young were reared that year. It was very satisfactory to me to breed this Dove, not only because it had never previously been bred in Europe, but because several of my avicultural friends, with far more suitable aviaries and with much more experience in the breeding of the *Columbæ*, had failed in the case of this species. Like all the African Bronzewings, the Tambourine Dove is perfectly peaceable. It is a singular fact that whereas the Asian and Australasian Bronzewings are all more or less pugnacious, the males of the various African forms dwell together in perfect amity. There is also a good deal of similarity in their notes, which, by the way, are far more like the sound of a tom-tom than a tambourine. That of the Tambourine Dove I have described as "*Hoo-hoo-hoo-hoo, hoo-hoo-hoo-hoo-hoo-hoo, ug-gug-gug-uggle-uggle,*" but I am not sure that the terminal rattle would not be better expressed by "*grrrrrrrrr*"; it is very rapid. The answer of the hen is "*perph, perph, perph,*" and then a soft, long-drawn "*berroo.*"

Blue-spotted Dove (*Chalcopelia afra*).

The adult male has the crown leaden-grey, changing to white on the forehead; the upper surface of the body pale brown with two black belts across the lower back and between them a pale brown one; upper tail-coverts narrowly tipped with black; bastard wing black; primary coverts and flights cinnamon, edged on outer web and tipped with dark brown; some inner median coverts and axillaries ornamented with bold spots of steel-blue and emerald-green; four central tail-feathers brown, becoming black at the tip, remaining feathers grey with black terminal belt, the outer ones with whitish base to the outer webs; chin and middle of throat buff-whitish; sides of head, neck, back of throat, and breast vinous, fading to buffish-white on the abdomen and vent; under tail-coverts, excepting the outer ones, black; axillaries and under wing-coverts bright cinnamon; bill dusky with broad orange tip; feet brownish-red; irides brown. Female slightly smaller and a trifle paler. Hab., Africa. I do not know the distribution of this species, as it has been confounded with the allied Emerald Dove (which is now separated into five slightly differing sub-species). For the same reason it is difficult to attribute the published field notes to the proper species, but I believe that Heuglin's notes refer to the present species, and therefore I shall assume that it is this Dove which makes its nest in the lower-growing acacias or *Zizyphus* bushes, sometimes placing it close to the main trunk a few feet from the ground, sometimes in the outer branches. As usual, the nest is carelessly constructed from a few twigs, and two yellowish-white eggs are laid.

The bird is seen in various places feeding upon wild stone-fruits, berries, tufted maize, and other seeds.

The breeding season is at the beginning of the rainy season, and then the very melodious song is heard.

According to Von Heuglin, it is "*Duu-duu-duu-du-du-du-du*"; but putting it down one day as the bird was uttering it, I made it, "*Tor; tor-tor: tor-tor-tor; tor-tor-tor-tor-tor-tor-tor.*"

I think it was in 1903 that I purchased what purported to be a pair of Emerald Doves, the male being the present species, and the reputed female (which proved to be also a male) the form of *C. chalcospila*, now regarded as typical.

Emerald Dove (*Chalcopelia chalcospila*).

Differs from the preceding species in its inferior size, rather less rufescent colouring, the metallic spots on the wings varying from deep emerald to golden-green (locally, I believe); the chin, middle of throat, and abdomen without buffish tinting; the bill dull black. Female smaller and paler than the male, with less alert and more squat appearance. Hab., Africa.

Messrs. Stark and Sclater say ("Birds of South Africa," Vol. IV., pp. 181, 182): "The Emerald-spotted Dove resembles the Tambourine Dove in its habits, but frequents somewhat more open ground, such as broken bush, clearings near the banks of rivers, and such-like localities; it obtains its food, which consists chiefly of grass-seeds, on the ground, and has a gentle cooing note —'Hoo hoo hoo-hoo'—in gradually descending scale, which is very characteristic, and once heard is never likely to be forgotten. Its nesting habits resemble those of other Doves. Andersson writes as follows: 'This Dove constructs a nest of a few rough sticks, in a bush or at the extremity of a bough of some low, stunted tree. The sticks composing the nest are so loosely put together that a person looking at it from below may see the two white eggs through the nest. It is seldom that more than one egg is hatched. The young are usually fledged by the middle of January.' Eggs in the South African Museum, taken in November, near Durban, are smooth, oval, and white with a creamy tinge; they measure 1.0 × .75."

I should not describe the note of this Dove as in a gradually descending scale, but rather as gradually halting to a finish, thus: "*Hoo-hoo, hoo-hoo, hoo-hoo-hoo, hoo; hoo; hoo: hoo: hoo.*" It is very like the song of the Maiden Dove, but not so loud. As already stated, my first specimen (from South Africa) was a female, given to me by Mr. Bonstow in 1902. At first the cock Tambourine Dove was very attentive to her, neglecting his own wife shamefully, but nothing came of the liaison beyond a broken egg or two. When I purchased a male (from West Africa), about a year later, I put the pair together in another aviary indoors. The hen occasionally laid a delicate pinky-white egg in a basket-nest fixed on the top of a cigar-nest-box, but she never sat for more than a day or two, the cock bird seeming disinclined to relieve her, so that all I could do was to blow the eggs for my collection. When blown they are of a dead-creamy or even sometimes buffish-white tint. Possibly the fact that the male *C. afra* and later on a pair of *Calopelia puella* were in the same aviary may have had something to do with the male bird's disinclination to sit. From time to time the hen became very feeble and temporarily lost the power of flight, but she constantly recovered until June 8th, 1908, when I found her dead.

The London Zoological Society purchased two pairs and received a third pair on deposit in 1866; in 1886 and again in 1887 a specimen was bred in the Gardens; so that I have little doubt, had I turned my pair by themselves into an outdoor aviary, I should have succeeded in breeding from them.

Maiden Dove (*Calopelia puella*).

The prevailing colour of the adult male is rich coffee-brown, paler and more cinnamon below; the head and back of neck are cobalt blue; the forehead and throat whitish-blue; lores black; lower part of neck and mantle with a vinous tinge; inner greater wing-coverts and secondaries spotted with golden green, or glittering

cupreous crimson; flights smoky-brown, their inner webs cinnamon towards the base; three outer tail-feathers more or less grey at the base and with a subterminal black belt, the tips coffee-brown like the rest of the upper parts; feet dull lake-red; bill dull slate-colour, dull lake-red at base; iris brown. Female rather smaller, but stouter; the chin sordid white, the throat slightly tinged with cinnamon and opaline, not blue; and the remainder of the under parts distinctly paler than in the male. The young bird has black bars on some of the scapulars, wing-coverts, and secondaries. Hab., West Africa, from the Gold Coast to the Gaboon.

Count Salvadori divides this into two species, regarding the bird with the coppery-lake spots and red base to bill as distinct from *C. puella*, but Captain Shelley says that they are not specifically distinct. The birds usually imported certainly belong to the latter form, and should, strictly speaking, be called Brehmer's Dove (*Calopelia brehmeri*). Count Salvadori describes the spots as golden coppery; but there is nothing golden about them, the colour being metallic lake-red, with a slight glint of copper in certain lights. It is evident that Dr. Sharpe agrees with Count Salvadori in regarding *C. brehmeri* as distinct, for he records it as one of the interesting species obtained by Mr. G. L. Bates on the Rio Benito, French Congo (cf. *The Ibis*, 1900, p. 534). In 1904, however, in an article on "Birds from Efulen in Cameroon," Dr. Sharpe says:—"It is interesting to find *C. puella* and *C. brehmeri* inhabiting the same country, and I incline to the idea that the latter may be the young of the former." This is certainly not the case, however.

Russ asserts that in West Africa this Dove lives in the bush, and that is the only note relating to its wild life which I have discovered. Its song is louder than that of the Emerald Dove, but otherwise very similar. When showing off to the hen neither this, nor any of the allied African Bronze-wing Doves, raises the wings over the back like the Asiatic and Australian Bronze-wings. Why Salvadori separated the African forms, putting the genus *Chalcophaps*, with its booming coo, between *Chalcopelia* and *Calopelia*, I am unable to guess.

The London Zoological Society first received an example of this Dove (but whether of the variety with green or lake-red spots is not clear) in 1870; in 1877 four more were purchased, all males. In 1884 the species reached the Amsterdam Gardens, and Cross, of Liverpool, received specimens, two of which he sent to Dr. Russ. In 1888 Miss Hagenbeck, of Hamburg, exhibited two specimens at the exhibition of the "Ornis" Society. A pair purchased by the London Zoological Society in 1884 probably came from Cross' consignment; others were presented in later years. In 1905 Hamlyn imported nearly a dozen examples, from which I purchased the first selected pair, Mr. Housden purchased a second pair, and I believe Mr. Seth-Smith secured the others. Most of these Doves died soon after their importation.

I purchased my pair on September 6. The female was taken ill early in November, but got better by the 23rd, then she had a relapse and died on the last day of the year. The male seemed rather pleased than otherwise when his wife died, and, for the first time, cooed and quivered his wings vigorously. I fancy that this quivering of the wings is intended to display the scintillating metallic spots to advantage. For some time this handsome bird paid court to the much smaller female Emerald Dove, and possibly her death in June, 1908, may have affected his health more than that of his natural mate, since he died on November 28 of the same year in nothing like such good plumage as he had previously exhibited. On the other hand, it is far more probable that this is the most delicate, as it is the most beautiful, of the African Bronze-wings, and that the chilliness of our climate at the beginning of winter has a disastrous effect unless the individual happens at the time to be in perfect health.

Mr. Seth-Smith, who eventually succeeded in establishing a healthy pair for a summer in his outdoor aviaries, perhaps had as good a chance of breeding this Dove as anybody; but, so far, I believe that no one has succeeded either here or on the Continent.

The Maiden Dove is in all respects charming in its colouring, its peaceable disposition, and its musical, though somewhat monotonous, notes. In an aviary it spends most of its time on a branch, like the other African Bronze-wings, chiefly descending to the ground for food or drink.

Australian Green-winged Dove (*Chalcophaps chrysochlora*).

Australian Green-winged Dove.

THE prevailing colour of the adult male is rich vinous, with a chocolate sub-tint, the nape slightly more purplish, the back and wings emerald green, with the bend of the wing snow-white; lower back dark, with two grey bars; outer tail feathers grey; feet dull crimson; bill bright red, with yellower cere; iris brown.

The female is slightly duller than the male, more chocolate in tint; the patch at bend of wing greyish or almost absent; tail above chestnut brown, the lateral feathers with a black subterminal belt; the outer feathers as in the male. In the young the outer webs of the flights are washed with chestnut. Hab., the Timor group, Moluccas, Papua, New Hebrides, New Caledonia, Australia, and Lord Howe's Island.

Gould says of this species ("Handbook," Vol. II., pp. 118, 119):—"The brushy districts are the localities peculiarly adapted to it, and these, I believe, it never leaves for the more open parts of the country; hence it is but little known to, and seldom seen by, the colonists, a circumstance the more to be regretted, as the beauty and brilliancy of its plumage and the neatness of its form render it one of the prettiest of the Australian birds. When flushed, it flies very quickly through the scrub, but to no great distance, and readily eludes pursuit by pitching suddenly to the ground, and remaining so quiet that it can rarely be discovered."

Mr. A. J. Campbell says ("Nests and Eggs of Australian Birds," p. 679):—"I first made its acquaintance in Northern Queensland (1885), where it is fairly numerous, and where we bagged several beautiful pairs. Again I met it in the 'Big Scrub,' New South Wales. Here it was frequently noticed flying quickly and low through the under-scrub. Being of terrestrial habits, it lives on fallen seeds and fruits." "Its call is a melancholy bellowing sound, two or three times repeated." He thus describes the nidification:—"*Nest.*—A frail, flat structure of twigs, placed in a low tree. *Eggs.*—Clutch, two; elliptical in shape; texture of shell fine, except on the smaller end, which is slightly granular; surface glossy; colour, light creamy white, but darker in tone than that of *Ptilopus superbus*. Dimensions in inches of

proper clutches: A (1) 1.12 × .87, (2) 1.05 × .84; B (1) 1.11 × .85, (2) 1.08 × .87."

A freely, but irregularly, imported species, of which I purchased a pair in December, 1896. I found them singularly apathetic as a general rule, though occasionally the male would attack my pair of Australian Bronze-winged Pigeons. They never showed the least inclination to breed while kept in an indoor aviary, although the hen would sometimes lay an egg on the ground, where it usually got broken unless already cracked when dropped. At length she lost the use of one of her wings, and I believe I gave her to Mr. Newman, in whose aviary she recovered. I replaced her by a second female, and on March 6th, 1906, the pair built in a shallow box, the male constantly driving about the cock Bronzewing Pigeon. However, nothing came of this attempt. On May 9th, 1907, I turned the pair into my larger garden aviary. The cock occasionally rocked with a curious pitching motion on a perch and boomed at the hen, but throughout the year they never bred, and during the winter the hen succumbed to the cold and wet, and I found her bedraggled, muddy, and dead on the floor of the aviary. I brought the cock bird indoors again late in the following autumn, and on March 13th, 1909, he died, having been in my possession twelve years and four months.

This Dove was first purchased by the London Zoological Society in 1861, and others have been added to the Regent's Park collection from time to time. Russ says that Bode, of Leipzig, imported several examples in 1883. Mr. Seth-Smith was successful in breeding it in his aviaries in 1906.

Indian Green-winged Dove (*Chalcophaps indica*).

In the adult male the forehead and eyebrow streak are white, shading into bluish-leaden on the crown and nape; bill coral-red with dusky cere; feet dull purplish-crimson; orbit livid fleshy; iris dark brown; otherwise very similar to the preceding species.

The female has the forehead dull grey and the eyebrow stripe narrower; the crown, nape, and upper back brown; under surface reddish-brown finely speckled with grey; bend of wing brown; four central tail-feathers brownish-black, two next with a chestnut tinge towards the base; outer feathers grey with black sub-terminal belt.

The young is said to be dusky brown above, with little green, and barred below. Hab., India and Ceylon, through Burmah and South China, through Malaysia to Western New Guinea and the islands in Geelvink Bay.

Jerdon observes ("Birds of India," Vol. II., p. 485): "This beautiful Ground-Dove is found throughout India, in forest countries, occasionally in well-wooded districts, as in lower Bengal, extending to Assam and all the countries on the east of the Bay of Bengal, as far as, at all events, Tenasserim. It is very partial to bamboo jungle, and occurs from the level of the sea up to 3,000ft., or perhaps higher. It feeds mostly on the ground, often on roads in forests and bare spots under trees, walking along with a rapid motion, and allowing a moderately near approach. Its flight is very rapid. It is generally seen alone. Its voice is a plaintive moan, or 'lowing *coo*,' as Layard calls it. Its eggs are said by Layard to be pale yellowish drab-colour, but Blyth says that they are merely of a less pure white than those of ordinary Pigeons or Doves. It soon becomes reconciled to confinement, and caged birds are usually for sale in Calcutta."

Colonel Legge says ("Birds of Ceylon," Vol. II., p. 717): "In the Western Province I have shot the 'Beetle-wing' in a state of breeding in June, but I have taken its eggs in the Kurunegala district in February, so that it probably breeds at no regular period, and very likely has more broods than one in the year. The nest I found was near Dyatura, built at the extremity of the lateral branch of a small tree at about 6ft. from the ground. It was made of small sticks, and slightly more cup-shaped than that of a true Dove (*Turtur*). It contained two eggs, regular ovals in shape, and of a warm buff or cream colour."

"Mr. Hume describes the nests as more regular saucers than those of the Doves, composed of roots, grass, or twigs, but comparatively neat and devoid of lining, with a decided central depression. It breeds in India from February till July. The eggs are said by this gentleman to vary from creamy white to white, and to measure from 1.0 to 1.1in. in length by from 0.82 to 0.86in. in breadth."

The Malays are said to give the name of "Fool Pigeon" to this bird on account of the ease with which they capture it. Concealing themselves behind an arbour of branches in a clearing, they scatter rice around, and the birds crowd round in such numbers and with so little suspicion that they are seized one after the other by hand and drawn into the arbour, the remaining Doves being too much absorbed to notice the disappearance of their comrades. On the other hand, in Upper Assam this bird is described as being shy.

Numbers of individuals of this species are sold in the Calcutta market; and, from time to time, consignments reach the London dealers. In 1898 or 1899 I had an opportunity of purchasing examples, but they were in very rough condition, and as I already possessed the nearly related Australian species I did not care to secure doubtfully healthy representatives of the Indian one.

The London Zoological Society first received this Dove in 1856, and has had numerous specimens of both sexes since that date, but, up to 1895, appears never to have succeeded in breeding it; but Dr. Russ bred it freely in his bird-room, the nest being formed in a wire cage hanging high up; Mr. Seth-Smith also bred it in his aviaries in 1904 and 1905.

Christmas Island Green-winged Dove (*Chalcophaps natalis*).

The male closely resembles that sex of *C. indica*, but the female has the neck, upper back, and breast coffee-coloured ("rufous-cinnamon"—Salvadori); the upper tail-coverts and central tail-feathers pure cinnamon; and the under tail-coverts similar and without blackish tips. It is about 1in. shorter than *C. indica*. Hab., Christmas Island.

Dr. C. W. Andrews says ("Monograph of Christmas Island," p. 39): "The Ground-Pigeon is by far the most brightly coloured of the birds of Christmas Island. It usually feeds on the ground, and can run rapidly. Though generally seen in pairs, small flocks sometimes occur, particularly near water. The food consists of small fruits. The nest is said to be placed in thickets of screw-pine (*Pandanus*), but I never saw either it or the eggs. At pairing time the males fight fiercely, and are said to kill one another occasionally. Young birds are seen in April. In spite of the brightness of the colouring this bird is difficult to see, the green of the

INDIAN GREEN DOVES.

back and chestnut-brown of the breast matching very closely the colours of the leaves and soil."

A specimen of this Dove reached the Gardens in Regent's Park in October, 1903.

Bronze-winged Pigeon (*Phaps chalcoptera*).

The adult male has the anterior half of the crown ochreous buff; behind this is a dull purplish band which extends on to the sides of the crown; posterior half of the crown, back of neck, and upper surface brownish-grey; the scapularies, feathers of back, rump, and upper tail-coverts with paler edges; three outer rows of wing-coverts with large patches of metallic emerald-green, changing in certain lights to burnished fiery copper; the inner secondaries with large patches of shining violet, changing to greenish Prussian-blue; inner webs of flights reddish-cinnamon towards the base; two central tail-feathers like the back, the remainder greyer excepting at tip and with subterminal black belts; lores black, an angular buffish line partly enclosing the eye above; and, below the eye, a white line which extends over the ear-coverts; the latter, the cheeks, and sides of the neck are bluish-ashy; throat white; breast vinous, changing to grey on the abdomen; flanks brownish-grey; axillaries and under wing-coverts cinnamon; feet salmon-red; bill slaty-black; iris chestnut-brown.

The female lacks the buff anterior half of the crown, which is uniformly coloured, the margins to the feathers of the upper parts broader and reddish-grey; the breast greyer with brownish edges to the feathers. The young is said to resemble the female. Hab., Australia and Tasmania.

Gould says of this species ("Handbook," Vol. II., pp. 123-124): "It is a plump, heavy bird, weighing when in good condition fully a pound; and is constantly eaten by every class of persons resident in Australia. Its amazing powers of flight enable it to pass in an incredibly short space of time over a great expanse of country, and just before sunset it may be observed winging its way over the plains or down the gullies to its drinking-place. During the long drought of 1839-1840, when I was encamped at the northern extremity of the Brezi range, I had daily opportunities of observing the arrival of this bird to drink; the only water for miles, as I was assured by the natives, being that in the immediate vicinity of my tent, and that merely the scanty supply left in a few small natural basins in the rocks, which had been filled by the rains of many months before." "Seldom, if ever, however, did the Bronze-wing make its appearance during the heat of the day, but at sundown it arrived with arrow-like swiftness, either singly or in pairs. It did not descend at once to the edge of the pool, but dashed down to the ground at about ten yards' distance, remained quiet for a short time, then walked leisurely to the water, and, after drinking, winged its way to its roosting-place." "The Bronze-wing feeds almost entirely on the ground, where it finds the various kinds of leguminous seeds that constitute its food. It breeds during August and four following months, and often rears two or more broods; the eggs are white, and two in number, $1\frac{3}{8}$ in. long and 1 in. broad.

"Its nest, which is very similar to that of the other members of the family, is a frail structure of small twigs, rather hollow in form, and is usually placed on the horizontal branch on an apple or gum tree near the ground, those trees growing on flat meadow-land near water being evidently preferred."

I purchased a pair of these pigeons, at rather a high price, on July 5, 1897, and both sexes soon came into perfect plumage. Unfortunately, the cock proved to be rather an old and gouty-footed individual, so that (with the best intentions to assist his wife in the duties of incubation) he invariably breaks the eggs which from time to time are deposited. I have thus been unfortunate enough not to breed this bird, though I entrusted the eggs, from time to time, to Barbary Doves; but my friend Mr. D. Seth-Smith successfully bred the Bronze-wing in 1887, and Miss Alderson and others have been equally lucky.

As regards its behaviour in captivity, when first received it is rather wild and nervous, but it soon settles down and becomes as steady as any Dove, except, perhaps, the "Bleeding Heart" and the "Barbary." When nesting it is inclined to be aggressive; but, being an arrant coward, the much smaller *Zenaida auriculata* made its life such a burden, by incessantly chasing it from pillar to post all over the aviary, that I had to remove a pair of these tormentors to another enclosure, where, however, they were equally disagreeable to other Doves. The coo of the Bronze-wing is like the groan of a horse wounded to death—a weird and awful sound!

My birds are still living as I write this account in July, 1909, so that they have been twelve years in my possession. I tried them for two years in my larger outdoor aviary, where they stood the cold of winter perfectly, but never attempted to breed. In the summer of 1908, and again in 1909, the hen was plucked bare as regards her neck and back by a pair of Tree-Sparrows in the same aviary, who used the feathers for building-purposes, but apparently without laying. Whether this treatment has weakened her I cannot say, but she has, to all intents and purposes, lost the use of one leg, and hobbles about in a distressing fashion.

The London Zoological Society acquired its first example of this beautiful pigeon in 1859, and bred it in the Gardens two years later; since that date

Hen Bronze-wing Pigeon.

Young Bronze-winged Pigeons.

numerous specimens have been added to the collection by presentation, exchange, deposit, and repeated breeding. On May 1, 1907, I and other members of the Avicultural Society accompanied the Editor of the Society's Magazine to the Southern Pheasantry of the Zoological Society's Gardens to witness the liberation of a number of foreign Doves with a view to their acclimatisation in Regent's Park. On that day eleven Crested Pigeons, four Bronze-wings, three Half-collared Turtle-Doves, four Necklaced and one Senegal Dove were set free, and others were liberated ten days later; so far as I have heard, there is no evidence that the Bronze-wings nested at liberty, though the Crested Pigeons and some of the Doves did; indeed, I saw one or two nests myself later on. Some of the birds made their way to the Botanical Gardens.

Brush Bronze-winged Pigeon (*Phaps elegans*).

Hind neck and upper back chestnut; scapulars, lower back, rump, and upper tail-coverts olivaceous-grey; upper wing-coverts also olivaceous-grey, but the smaller and outer ones tinged with chestnut, the innermost median and greater coverts metallic green on outer webs and broadly tipped with grey; the metallic patches on the median coverts shot with copper and the innermost of those on the greater coverts with steel blue; flights brown, cinnamon at base of inner webs; the primaries with the base of outer webs edged with the same colour; central tail-feathers olivaceous-grey, the next two pairs brownish-chestnut towards the base, the remaining pairs grey; all the lateral tail-feathers with a subterminal blackish band and greyish-brown tips; forehead ochreyellow; crown and back of head grey; a broad chestnut stripe from back of eye round back of head; a black loral line; upper cheeks and upper ear-coverts whitish; lower cheeks and under surface of body olivaceous-grey, becoming greyish-brown on tibial feathers and vent; a triangular chestnut spot on the throat; under wing-coverts cinnamon; feet bright lake-red; irides dark brown. Female duller throughout and with the forehead much less buff; decidedly paler than in the male.

Gould says of this bird ("Handbook," Vol. II., pp. 125, 126): "It affects the most scrubby localities, giving preference to such as are low and swampy; and I have never seen it perch on the branches of trees. When flushed it rises very quickly, with a loud burring noise similar to that made by the rising of a Partridge. The shortness of its wings and tail, and the extreme depth of its spectoral muscle, render its appearance more plump and round than that of the generality of Pigeons. It is a very difficult bird to shoot, from its inhabiting the denser parts of the scrub, from which it is not easily driven. It flies but little, rarely for a greater distance than to cross a gully or top a ridge before it again abruptly descends into the scrub.

"Its food consists of seeds and berries of various kinds, particularly in Tasmania of a plant there called Boobyaller.

"I believe it never migrates, but merely removes from one locality to another, as food may be more or less abundant.

"Its note, more lengthened than that of the Common Bronze-wing, is a low and mournful strain, and is more often repeated towards the close of the evening than at any other time."

"In Western Australia it has been observed to breed sometimes on the ground, and in a fork of the *Xanthorrhœa* or grass tree; the nest being formed of a few small sticks, and the eggs, as usual, being white and two in number, fifteen lines long by eleven lines broad."

Mr. D. Seth-Smith secured three examples of this Pigeon from a London bird-dealer in January, 1904, and a pair went to nest in his aviaries almost immediately, the first egg being laid ten days after their arrival; one young one was hatched in February, but was not reared. The birds nested again, and two young were nearly reared when the parents began to build a third time, and neglected the nestlings, one of which consequently died, but the other was reared. The hen was then paired up with the second cock in a suitable outdoor aviary, and on April 26th the first egg was laid, another being laid the next day; both young flew on June 3rd.

In an aviary this species roosts on trees quite as much as the commoner Bronze-wing; its usual nesting season is from October to January in its own country. Although a nice species to breed, and not frequently imported, there is no great demand for the young birds.

The Brush Bronze-winged Pigeon reached the Amsterdam Zoological Gardens in 1857, the London Gardens in 1881, and the Berlin Gardens in 1893.

Harlequin Bronze-winged Pigeon (*Histriophaps histrionica*).

Upper surface cinnamon brown; the marginal wing-coverts bluish-grey; edge of wing white; bastard-wing, primary coverts, and primaries grey tipped with white, the latter tinged with pale brown on outer webs and with the basal part of inner webs cinnamon; inner secondaries with a patch of metallic purple on outer webs; the two last also with a white subterminal spot; lateral tail-feathers bluish-grey at base, becoming black towards extremity, which is white; forehead, a stripe from back of eye encircling the ear-coverts, and a gorget snow-white; rest of head, throat, and ear-coverts jet-black; breast and abdomen bluish-grey; under tail-coverts grey at base, pale buff at tip; under wing-coverts bluish-grey; bill black; feet lilacine-red in front, flesh-red behind; irides dark brown; naked orbital skin purplish-black. Female without white on the fore-

head, which is of the same colour as the rest of the upper surface; ear-coverts and throat dull blackish; the gorget and a patch below the ear-coverts whitish buff; lower throat pale sandy-brown; tips of primaries and lateral tail-feathers whitish buff. Hab., "Interior of Australia, and also Ports Darwin and Derby, N.W. Australia." (Salvadori.)

Gould quotes the following remarks by Captain Sturt ("Handbook," Vol. II., pp. 129, 130):—"This beautiful Pigeon is an inhabitant of the interior. It lays its eggs in February, depositing them under any low bush in the middle of the open plains. In the latter part of March and the beginning of April they collect in large flocks, and live on the seed of the rice-grass, which the natives also collect for food. During the short period this harvest lasts the flavour of this Pigeon is most delicious, but at other times it is indifferent. It flies to water at sunset, but, like the Bronze-wing, only wets the bill. It is astonishing, indeed, that so small a quantity as a bare mouthful should be sufficient to quench its thirst in the burning deserts it inhabits. It left us in the beginning of May, and I think migrated to the N.E., for the further we went to the westward the fewer did we see of it."

Mr. A. J. Campbell ("Nests and Eggs of Australian Birds," p. 684) describes the eggs as follows:—"Clutch, two; elliptical in form; texture of shell fine but strong; surface glossy; colour, white, with a slight creamy tone. Dimensions in inches: (1) 1.32 × .98, (2) 1.24 × .98."

According to Mr. A. J. North this species has bred in captivity in the aviary of the late Hon. William Macleay, of Elizabeth Bay, during 1887-88. Mr. North asserts that July and August are the usual breeding season of this species, but Mr. Campbell seems to think that this statement lacks proof.

The London Zoological Society secured this Pigeon in 1865, and bred it the year following; it also nested in the park of Beaujardin, near Tours, where, in 1881, a pair brought up six young. It is a rare bird in the market.

Partridge Bronze-winged Pigeon.
(*Geophaps scripta*).

The adult male above is pale brown, the upper wing-coverts with paler tips; the forehead somewhat ashy; outer webs of several of the greater coverts with a patch of purple shading into greenish, and obscured by darker bars; tail-feathers, excepting the two central ones, greyish-brown at the base, and broadly tipped with black; lores, black; a broad stripe from the lower mandible to beneath the eye, a second from the posterior angle of the eye down the side of the neck, a spot on the side of the neck, the chin and throat snow-white; the intervals between these markings jet-black, this colour surrounding the eye and forming a crescent across the lower part of the throat; abdomen, grey; flanks, white; feet, deep purplish-crimson; bill black; naked skin round eye, bluish leaden, the corners of the iris mealy wine-red; iris black.

The female resembles the male in plumage, but is slightly smaller. Hab. North-Western and Eastern Australia, from Rockingham Bay through the interior to Victoria.

In its habits this bird is very aberrant, behaving in some respects more nearly like a Quail than a Pigeon. Gould says that he usually observed it in small companies of four to six in number, which, when approached, ran off with great speed and crouched down on the bare plain or among scanty herbage, where it often remained until almost trodden on. When finally flushed it flies rapidly, with much noise, either alighting on another part of the plain or upon the branch of a tree, on which it squats, like the Nightjar, in the same line with the limb. The eggs—two in number—are deposited upon the bare ground. The food consists of grass and other seeds, and at certain seasons insects and berries.

According to Dr. Ramsay, the nest consists of a shallow hole in the ground beside a tuft of grass, and lined with a few blades of dry grass. The eggs—two in number—are creamy white.

The coo, according to Dr. Russ, is either short or prolonged; he says that its flight is wild and exceedingly swift, and that at night it roosts upon a tolerably high branch, but neither Mr. Seth-Smith nor Mr. Newman mentions this habit. The Partridge Bronze-wings are far more terrestrial than arboreal. This Pigeon was first presented to the London Zoological Society in 1883, the following year a specimen was purchased, and three more were added in 1891, in which year two young were bred in the Gardens.* It was present in the Amsterdam Gardens in 1882, and in 1883 and 1884 Baron von Cornely bred it at his castle in Beaujardin; young were reared at the Melbourne Gardens in 1904; Mr. Seth-Smith possessed specimens, but failed to breed from them; they then passed into the possession of Mr. T. H. Newman, who bred them three times (four young birds) in 1908; he says that the young when hatched are not more covered with down than several other species of Pigeons. Incubation lasts seventeen days. A study of Mr. Newman's article (*The Avicultural Magazine*, Second Series, Vol. VI., pp. 337-343, and Vol. VII., pp. 40-45) will be found both interesting and instructive. Mr. Seth-Smith says that these birds are perfectly hardy, and that they live on good terms with other birds excepting their near allies, such as *G. smithi* or *Lophophaps*.

Smith's Bronze-winged Pigeon
(*Geophaps smithi*).

Upper surface brown tinged with olivaceous; outer webs of inner greater wing-coverts and inner secondaries rich purple shot with green; flights brown, with narrow buff edges to outer webs; lateral tail-feathers with a broad subterminal black belt; a white line from the nostrils passing over the eye and a second from base of lower mandible passing under the eye enclosing the reddish-orange naked orbital skin; cheeks brownish-grey; throat white surrounded by a narrow grey band; sides of breast white; feathers on centre of breast clear grey with black edges at tips, those on lower breast with a narrow subterminal dark band and whitish edge; middle of abdomen and vent fawn-coloured; flanks and under tail-coverts dark grey edged with fawn or tawny; flights below grey; bill blackish-grey; feet bluish-grey, yellowish-grey at back and on soles; irides with an inner red ring, a central purple one, and an outer broader ring of pure white narrowly encircled outside by a grey ring. Female similar to the male, but smaller. Hab., "N.W. Australia, from Derby to the Gulf of Carpentaria." (Salvadori.)

Gould says of this Pigeon ("Handbook," Vol. II., pp. 133, 134): "Like the *G. scripta*, this bird, which at Port Essington is termed the Partridge, differs considerably from its congeners in its general habits, flight, voice, mode of incubation, and the character of its newly-hatched young. It is rather abundant in all parts of the Peninsula, is mostly seen in small families, and

* Mr. Seth-Smith says that the eggs were hatched under Barbary Doves, but apparently not reared; yet they are entered in the society's list.

always on the ground, unless when disturbed or alarmed; it then usually flies into the nearest tree, generally choosing the largest part of a horizontal branch to perch upon. When it rises from the ground its flight is accompanied with a louder flapping or burring noise than I have observed in any other Pigeon.

"Its note is a coo, so rolled out that it greatly resembles the note of the Quail, and which, like that bird, it scarcely ever utters but when on the ground, where it frequently remains stationary, allowing itself to be almost trod upon before rising. Its favourite haunts are meadows covered with short grass near water, or the edges of newly-burnt brush. It would seem that this species migrates occasionally from one part of the country to another; for during the months of September and October not a single individual was to be seen, while at the time of my arrival and for a month after they were so abundant that it was a common and daily occurrence for persons to leave the settlement for an hour or two and return with several brace; in the latter part of November they again appeared, but were not so numerous as before; and in the January and February following they were rarely to be met with, and then mostly in pairs inhabiting the long grasses clothing the moister parts of the meadows.

"It incubates from August to October, making no nest, but merely smoothing down a small part of a clump of grass and forming a slight hollow, in which it deposits two eggs, which are greenish-white, one inch and a quarter long by seven-eighths of an inch in breadth. The young bird on emerging from the egg is clothed with down like the young of the Quail."

Mr. Seth-Smith says that a pair in his aviary which persisted in nesting in the winter, scratched a depression in the ground (in which they placed a few bits of hay or small sticks) close to the door of the aviary, so that it was impossible to enter without disturbing them. The birds took turns in incubation like other Pigeons, but the young, which died when about to hatch, were thinly covered with whitish down.

The London Zoological Society has possessed one pair of this species, Mrs. Johnstone had another pair, and Mr. Seth-Smith had four specimens.

Plumed Ground-Dove (*Lophophaps plumifera*).

Pale cinnamon; back of neck and mantle with obsolete brown bars; upper wing-coverts and scapulars grey at base, brown in the middle and with cinnamon rays at the tip; tip and outer web of first primary brown, otherwise the primaries are cinnamon; secondaries brown, edged with rufous, cinnamon at base of inner webs; three of the inner secondaries with an oblong bronzy-purple spot on their outer webs; central tail-feathers earth-brown; lateral feathers with the base of outer web brownish-cinnamon, of inner web greyish, the terminal portion black; forehead and a line on the sides of the crown grey; naked lores and orbital skin crimson or orange-red, edged above and below by a narrow black line; centre of crown and crest-feathers cinnamon, the latter becoming whitish-buff towards the tips; upper part of ear-coverts silvery-white, lower part silvery-grey; cheeks and throat white; chin, a central stripe on the throat, and gorget, black; a crescentic band of grey on the chest edged behind by a narrower black band; centre of abdomen pure white; flanks cinnamon; under wing-coverts cinnamon; under tail-coverts brownish-grey with whitish outer webs; bill olivaceous-black; feet greenish-grey, ashy between the scales; irides yellow. Female slightly smaller than male. Hab., N.W. Australia.

Gould quotes the following notes by Elsey ("Handbook," Vol. II., p. 136): "This lovely little bird was abundant on the Victoria, especially about rocky holes and exposed hot gullies and on the hot sandy beds of the broad rivers of the Gulf, where it was strutting about in the full glare of the sun, with its crest erect. I have shot six or eight at a time on those rivers."*

Mr. A. J. Campbell thus describes the nidification ("Nests and Eggs," p. 691): "*Nest:* A slight depression in the ground, sheltered by herbage—spinifex, etc. *Eggs:* Clutch, two; elliptical in shape; texture of shell fine; surface, glossy; colour, light creamy-white. Dimensions in inches, 1.0 by .79."

"The species probably lays at any period of the year, but the principal breeding months, no doubt, include those from October to March. Dr. W. MacGillivray, who has found these Pigeons plentiful in the Cloncurry Ranges, took eggs usually in October. They were placed on the bare ground, under a spinifex tussock, on the seeds of which the birds feed."

Russ says that this Pigeon reached the Zoological Gardens of Amsterdam in 1865; G. Bosz, of Cologne, offered two pairs at a high price in 1893, a coloured illustration of which was forwarded to him and identified as this species; these two pairs found their way to the Zoological Gardens of Cologne and Berlin; in 1894 several specimens were imported, no less than three pairs being exhibited at the show of the "Ægintha" Society, and in succeeding years others came into the German market; a female in the possession of Nagel, a chemist, laid several eggs, but invariably soft-shelled. The ninth edition of the London Zoological Society's "List of Animals" records a pair purchased in 1894, and two pairs received in exchange, and in 1895 four young ones bred; but Mr. Seth-Smith tells us that all these belonged to the white-banded form, *L. leucogaster*, and he believes that all subsequently imported, including a large consignment in 1904, belonged to the latter species; he also expresses a doubt whether *L. plumifera* has ever been seen alive in this country, if, indeed, in Europe. It would, however, be rather odd if the directors of the Zoological Gardens of Amsterdam, Berlin, and Cologne, as well as Dr. Russ (who probably got his coloured illustration named at the Berlin Zoological Museum) should *all* have fallen into the same error.

White-bellied Ground-Dove (*Lophophaps leucogaster*).

Differs from the preceding species in its paler and duller cinnamon colour, a distinct whitish band in front of the grey pectoral band, the whitish centre to the breast and the buff abdomen and vent. Female slightly smaller. Hab., S. Australia and Victoria River, N.W. Australia.

From Mr. A. J. Campbell's account of this bird, it is evident that its habits resemble those of *L. plumifera*. He thus describes the nidification ("Nests and Eggs," p. 694): "*Nest.*—A slight hollow in the ground, with a few loose blades of grass in or around, and sheltered by a tussock. *Eggs.*—Clutch, two; elliptical in shape; texture of shell fine; surface glossy; colour, light creamy white. Dimensions in inches of a proper clutch: (1) 1.05 by .8, (2) 1.03 by .81; of another pair: (1) 1.04 by .8, (2) 1.03 by .8."†

Doubtless Mr. Seth-Smith is correct in identifying all the birds imported since 1894 with this species, and it

* Did these notes relate to *L. plumifera* or *L. leucogaster*? It is certain that Elsey obtained the latter on the Victoria River.

† Dr. Stirling says that the eggs are dull creamy white, with a rather rough surface and lacking the usual glossy surface of Pigeon eggs.

is probable that a male owned by Mrs. Rathbone a year earlier, and a pair belonging to the Contessa Baldelli at Florence in 1904 were also of this species. In 1905 Mr. Seth-Smith obtained five specimens, and in *The Avicultural Magazine*, Second Series, Vol. V., pp. 51-54, he has published some interesting notes on the Plumed Doves, illustrated by a coloured plate and a cut representing the display of this species. In April, 1907, ten specimens found their way to the Regent's Park Gardens.

AUSTRALIAN CRESTED PIGEON (*Ocyphaps lophotes*).

The adult bird has the entire head, breast, and abdomen grey, but the crest on the head black; back and rump olivaceous grey; upper tail-coverts greyish-brown with white tips; sides of neck and breast rosy; small and median upper wing-coverts sandy-grey, the outer ones pure grey; each feather with a subterminal black band; greater wing-coverts metallic green with white borders; primaries greyish-black; secondaries broadly white edged, the inner ones with their outer webs metallic violet shading into blue; two central tail feathers brown; the others blackish-brown, faintly glossed with purple, blue, and green on their outer webs, and tipped with white; under wing-coverts pale grey; flanks brownish; under tail-coverts deep grey; tail below brownish-black, tipped with white; feet crimson-pink; bill olive-blackish; naked skin round eye pink; iris orange.

The female resembles the male, but is perhaps very slightly smaller; the young bird is also similar. Hab., Interior of Northern and Eastern Australia, from Port Darwin and Port Essington to Southern Australia.

Gould says of this species ("Handbook," Vol. II., pp. 139, 140): "It frequently assembles in very large flocks, and when it visits the lagoons or river-sides for water, during the dry seasons, generally selects a single tree, or even a particular branch, on which to congregate before descending simultaneously to drink.

"Its flight is so rapid as to be unequalled by those of any member of the group to which it belongs; an impetus being acquired by a few quick flaps of the wings, it goes skimming off apparently without any further movement of the pinions. Upon alighting on a branch it elevates its tail and throws back its head, so as to bring them nearly together, at the same time erecting its crest and showing itself off to the utmost advantage.

"I met with the nest of this species in a low tree, on the great plain near Gundermein on the Lower Namoi, on the 23rd of December, 1839; like that of the other species of Pigeon, it was a slight structure of small twigs, and contained two white eggs, which were one inch and a quarter long and nearly an inch broad, upon which the female was then sitting."

I purchased a pair of this handsome Pigeon in December, 1896, and shortly afterwards the hen laid an egg on the earth; but from that time onward, in spite of every opportunity being afforded, no attempt at nesting was made; yet the cock bird was constantly bowing to her with tail elevated fanwise, and the wings thrown up over the back, the secondaries opening and closing, so that, combined with the brilliant greater coverts, they formed a nearly perfect rainbow of metallic colour, set off by the tail. As it bows, the male utters its monotonous grunt-like coo, repeating it to each movement of head, wings, and tail.

The late Mr. Abrahams assured me that my birds were two cocks, and when I asked him how he accounted for one of them having laid an egg, he at once turned round and said they must be two hens. If they were, one of them certainly showed off to the other most indefatigably. I got tired of keeping these profitless and somewhat boisterous birds at last, and, after having had them nearly seven years, I sold them on September 26th, 1903.

Probably no Pigeon is so nervous and wild in captivity as this, and yet it has been frequently bred both in zoological gardens and by private individuals. During the breeding season it is aggressive towards other Doves, but I do not at all agree with Dr. Russ that it is a dangerous bird to keep either in bird-room or aviary, for I know no Dove which quarrels with birds of other orders, excepting perhaps the spiteful little Passerine Dove.

This Crested Bronze-winged Pigeon appears to adapt itself to acclimatisation more readily than any

AUSTRALIAN CRESTED PIGEON.

other, breeding freely at liberty both at Woburn Abbey and in Regent's Park. Whether it would be able to get its own living, if not supplied with seed, remains to be seen. There seems no reason why it should be less capable of providing for itself than our native Doves.

It is said to have been bred in the Zoological Gardens in 1859, and again in 1865, 1866, 1867, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, and so on up to at least 1895.

CHAPTER XX.

GROUND DOVES AND PIGEONS.

(Sub-family Geotrygoninæ).

Most of the birds placed in this sub-family are of robust habit with stout and rather long legs; the wings short, broad, and rounded, but the primaries distinctly longer than the secondaries. They may be fed in captivity much in the same manner as the Turtle-Doves. The species of *Phlogœnus* and *Leucosarcia* are essentially ground birds; that is to say, they spend much of their time running about on the earth, not going there merely

to feed like the species of *Leptoptila* when in captivity.*

Rufous-necked Wood-Dove (*Haplopelia larvata*).

Upper surface brownish-olive; interscapular region slate-colour, with green-shot coppery edges to the feathers; flights greyish-brown; four central tail-feathers of the same colour, but the outer pair greyish towards the extremity; remaining feathers blackish-brown, with a broad dark grey terminal belt; front of head and upper throat white; cheeks and ear-coverts also white, but tinged with vinous ash; back of head and neck coppery-purple, sometimes with green reflections, most defined at back of hind neck; fore neck and breast dull vinous, the former with metallic purple shades, the latter passing into dusky brown on the sides of the body and into cinnamon on lower breast, abdomen, and under tail-coverts; bill black; feet dark pink; irides with an inner dusky circle and an outer pink one; eyelids and orbital skin pink. Female slightly smaller and duller. Hab., South Africa.

Messrs. Stark and Sclater say ("Birds of South Africa," Vol. IV., pp. 183, 184): "The Lemon Dove is confined to the forest and thick bush, and is seldom or never found outside. It is generally seen on the ground seeking its food, which consists chiefly of forest berries; it is shy and by no means easy to see or procure, but can often be heard rustling among the fallen leaves, and thus causing disappointment to the sportsman who is lying in wait for buck; it has a peculiar, short, melancholy coo. Shelley found two nests of this bird on April 11th in the bush near Durban; they were placed about 4ft. from the ground in low creepers close to the path, and contained two eggs each. The nest was a flimsy structure of sticks.

"Eggs in the South African Museum, taken near Durban by Mr. Millar in November, are oval in shape, white, with a slight tinge of brown, and measure about 1.0 × .75."

Two specimens of this Dove were presented to the London Zoological Society in 1892.

In the Report of the additions to the animals in the London Zoological Society's collection for 1907 it is stated that eleven specimens of Verreaux's Dove (*Leptoptila verreauxi*) were presented by Sir William Ingram; but Mr. T. H. Newman writes that he believes them to be only *L. reichenbachi*. He has two of the latter. Under these circumstances I think it would be premature to claim Verreaux's Dove as an imported species.

Red-underwinged Dove (*Leptoptila rufaxilla*).

Above olive-brown, the hind neck and upper mantle purplish-violet, and the back slightly purplish; primaries slate-brown, bases of inner webs of all the flights more or less washed with cinnamon; central tail-feathers olive-brown, lateral ones blackish, the two outer pairs with white tips; forehead whitish-grey shading into bluish-grey on the crown, into dull purple on back of head, the last colour merging into the violet of the hind neck; chin and centre of throat white; sides of head and upper throat reddish; sides of neck and lower throat vinous, paler on the breast; sides and flanks olive-brown; abdomen white; under tail-coverts with the outer webs more or less brown, the inner ones white; under wing-coverts cinnamon; bill black; feet probably lake-red. Female doubtless a trifle duller in colour, and with greyer forehead. Hab., "Guiana, Amazonia, Peru, Ecuador, and Colombia." (Salvadori.)

According to Russ, Burmeister states that this Dove is abundant in the forest region of Brazil, "not in open situations, but on narrow forest-paths one frequently meets with it on the earth. It also nests in the forest, and at a moderate height, and lays two small white eggs." Its breeding season, according to Euler's statement, falls in the months of September to May, and he believes that it has four broods in the year.

Dr. Goeldi met with this Dove during a visit to South Guyana "in the low campos-grass behind the 'sitio.'" (Cf. *The Ibis*, 1897, p. 164.)

Taczanowski only tells us that it inhabits the forests of Eastern Peru.

Young Rufous Doves.

This Dove first reached the Regent's Park Gardens in 1880; two examples also were presented in 1883, and another was purchased in 1891.

Rufous Dove (*Leptoptila reichenbachi*).

Above glossy brownish-olive; back of head, nape, and upper mantle brown glossed with purple; primaries brown, the inner webs washed with cinnamon; four central tail-feathers brownish-olive, the others more slaty, becoming blackish towards the tips, the three outer pairs with white tips; forehead whitish, shading into bluish-grey on the crown; cheeks, sides of neck, lower throat, and breast deep reddish-vinous; chin and middle of throat whitish; sides and flanks brown; middle of abdomen white; under tail-coverts brown, their inner webs whitish towards the tips; under wing-coverts cinnamon; bill black, feet probably lake-red. Female doubtless slightly duller and with the forehead greyer. Hab., South Brazil and Uruguay.

Burmeister says ("Systematische Uebersicht," Vol. III., p. 305): "Of all the Doves which I have seen in my travels this is the commonest in the forest region; it also moves about a good deal on the earth, but one does not see it in open spots, where *C. talpacoti* is everywhere running in the road, but only in the narrow forest-paths, where it can tolerably easily escape under shelter. It nests in the forest, tolerably high, and lays

* In their wild state all the *Geotrygoninæ* appear to pass most of their time on the earth.

two white, rather short eggs, of which I have only brought one home; the second got smashed on the journey."

It almost looks as if Russ had obtained his information respecting *L. rufaxilla* from Burmeister's account of the present species. The species of *Leptoptila* have certainly been a good deal muddled over by naturalists; but fortunately the Museum catalogue has disentangled the confusion. Miss Rosie Alderson successfully bred this Dove in her aviaries in 1904, and has published an account of her experiences in *The Avicultural Magazine*, Second Series, Vol. II., p. 273. Mr. Castle-Sloane, who bred it subsequently, says that incubation takes seventeen days.

Apparently this is the Dove of which Sir William Ingram gave eleven specimens to the London Zoological Society in November, 1907, and of which Mr. Newman possesses two specimens.

Bronze-naped Dove (*Leptoptila chalcauchenia*).*

Upper surface greyish-brown; top and back of head and hind neck leaden-grey, with glittering bronze-green edges to the feathers; flights brown, cinnamon towards base of inner webs, and with narrow pale edges to outer webs; centre tail feathers brownish-grey, the others grey at base, blackish towards tips, white at tips; the outer feathers with a narrow white edge to outer webs; forehead and chin whitish; throat and breast pale vinaceous, fading to white on abdomen and under tail-coverts; under wing-coverts cinnamon; bill black; feet pink; irides orange. Female doubtless with greyer forehead. Hab., South Brazil, Paraguay, Uruguay, and Argentina.

According to Hudson ("Argentine Ornithology," Vol. II., pp. 144, 145):—"This Dove . . . inhabits the woods of the Plata district, and never, like other Pigeons, seeks the open country to feed. It is solitary, although, where many birds live in close proximity, three or four may be sometimes seen in company. It spends a great deal of time on the ground, where it walks about under the trees rather briskly, searching for seeds and berries. Their song is a single uninflected and rather melodious note, which the bird repeats at short intervals, especially in the evening during the warm season. Where the birds are abundant the wood, just before sunset, becomes vocal with their curious far-sounding notes; and as this evening song is heard as long as the genial weather lasts, it is probably not related to the sexual instinct. The nest is a simple platform; the eggs are two and white, but more spherical in shape than those of most other Pigeons."

Miss Rosie Alderson bred this species in 1904 (cf. *The Avicultural Magazine*, Second Series, Vol. III., pp. 133, 134). In November, 1907, Sir William Ingram presented three specimens to the London Zoological Society, but this *Leptoptila* seems not to be a common one in the market.

Orange-winged Dove (*Leptoptila ochroptera*).

Differs from the preceding species in its inferior size; it may therefore be regarded as a local form. Hab., Brazil.

I have found no notes on the wild life of this Dove, but it is not likely to differ from that of typical *L. chalcauchenia*

A specimen was purchased by the Zoological Society of London in 1877, and another was presented in 1883.

* The name "Bronze-necked Dove," employed by the Zoological Society, has been for many years past in use for *Zenaida auriculata*.

White-fronted Dove (*Leptoptila jamaicensis*).

Above olive, more or less glossy, according to the light; hind neck cupreous red, glossed behind with bronzy or golden-green, changing to purplish-blue close to the mantle; flights greyish-brown, partly edged with whitish on outer webs; two centre tail feathers olive, the others greyish-brown with white tips, the outer ones also with white edge to the outer webs; shafts of feathers pale reddish-brown; forehead white, shading into grey on the crown and bronzy-grey on back of head; throat whitish-grey, pearly-white on the crop region, especially at the sides; lower breast, abdomen, and under tail-coverts white; sides slightly greyish-brown; under wing-coverts, axillaries, and inner webs of flights below cinnamon. Hab., Jamaica.

Gosse says ("Birds of Jamaica," pp. 313-316):—"This lovely Pigeon is chiefly confined to the upland districts, where its loud and plaintive cooing makes the woods resound. The negroes delight to ascribe imaginary words to the voices of birds, and indeed for the cooing of many of the Pigeons this requires no great stretch of imagination. The beautiful Whitebelly complains all day, in the sunshine as well as the storm, 'Rain-come-wet-me-through!' each syllable uttered with a sobbing separateness, and the last prolonged with such a melancholy fall, as if the poor bird were in the extremity of suffering. But it is the note of health, of joy, of love; the utterance of exuberant animal happiness; a portion of that universal song wherewith 'every thing that hath breath may praise the Lord.' The plumage, as usual in this family, is very soft and smooth, the expression of the countenance most engagingly meek and gentle. And it is a gentle bird: I have taken one in my hand, when just caught in a springe, full grown and in its native wildness, and it has nestled comfortably down and permitted its pretty head and neck to be stroked, without an effort to escape, without a flutter of its wings.

"This is one of those species which habitually live on the ground. In unfrequented woods as well as those which are open, as those which are choked with underwood, the Whitebelly walks about singly or in pairs, picking up various seeds. About Content, a densely wooded mountain side, it is very numerous in June and July, feeding on sop-seeds, and many are taken in springes. The physic-nut forms a large portion of its food, as well as orange-pips and fragments of the large seeds of the mango chewed by hogs. Its flesh is generally esteemed; it is white, juicy, and well-flavoured, without being liable to bitterness.

"As it walks to and fro, it frequently flirts the head and tail, but not so markedly as the Pea-Dove. If flushed, it betakes itself to a low tree not far off, whence, if unmolested, it is soon down again. Often when seen in the woods it runs a few yards, and then rises to fly, but as if trusting less to its powers of flight than to those of running, alights again immediately, and runs swiftly off among the bushes. It has no regular roosting place, often spending the night on a stone, or a log, or a low bush that happens to be near the spot where it was feeding at nightfall. This is not the case with the other Doves.

"The aspect and air of the Whitebelly are unlike those of its kindred. Its round head, the prevalence of light hues, and its height upon the legs, contribute to this peculiarity. Essentially a ground Pigeon, its length of tarsus enables it to run with ease and celerity; perhaps more rapidly than any other of the family.

"Unlike the tree Doves, the Whitebelly usually builds in rather a low situation; often a logwood, a favourite

tree with this and the Whitewing. If in the large woods, one of moderate height is chosen. The nest consists of a few loose sticks, with some leaves in the centre; the eggs are white."

Of late years, a fair number of examples of this Dove has been imported. In 1902, Mr. W. E. Parker recorded the loss of one in his possession, and the following year Miss Rosie Alderson bred the species and published an account of her experience in *The Avicultural Magazine*, Second Series, Vol. II., pp. 28-30; Mr. Castle-Sloane also bred it, and he says that incubation lasts fifteen days; others have been successful since then. An illustrated account by Mr. Seth-Smith was published in Vol. III. of the same magazine (pp. 87-89).

A pair of this Dove reached the Gardens in Regent's Park as long ago as 1867, and others have been added to the collection there in subsequent years.

Wells' Dove (*Leptoptila wellsi*).

The adult bird has the upper surface of a brownish-olive tint; the forehead pinky-white, shading into grey on the crown; back of head and nape dark olivaceous-brown, washed with purple; flights brown, the inner webs cinnamon; tail olive-brown, the shafts of the feathers blackish, the outer feathers darker and tipped with white; chin and upper throat white; cheeks, lower throat, and breast, dull vinous; chest, abdomen, and under tail-coverts white, the last slightly tinged on the outer webs with brown; sides, brown; axillaries and under wing-coverts, cinnamon; feet, crimson; bill, black; naked skin round eye, blue; iris, brown (?)*. The female is very similar, the forehead less white, and the colouring generally, perhaps, a trifle duller. Hab., Island of Tobago, W. Indies. I have found no field notes relating to this species. It is supposed to inhabit also the Island of Grenada, but this may be an error. The latter locality for the species was given to the Zoological Society by Mr. S. Wells, who, in August, 1886, presented a pair to the Gardens; in any case the species appears to be not uncommon in Tobago.

This Dove, which has very much the character and habits of *Zenaida*, probably spends much of its time on the earth in search of fallen seeds and berries, like the other species of the genus, but in captivity the term Ground-dove is not descriptive of them, since they often spend nearly the whole day upon a branch, only visiting the ground to feed.

In May, 1898, I obtained what I then supposed to be a pair of this species from Mr. J. C. Pool, of Birmingham, in exchange for other birds. One of these, a hen, had been pinioned, and was killed two years later by my Crested Pigeons; the other, which I regarded as a male, but which eventually proved to be a female, was for some years associated with two species of *Zenaida* in my bird-room, and agreed fairly well with them, probably because it did not happen to be a male. For this reason also it never uttered a note, and I came to the conclusion (see "Foreign Bird-keeping," Vol. II., p. 98) that it was rather a stupid bird. Later I transferred it to one of my indoor covered aviaries, where it had a pair of Bronze-wing Pigeons and a pair of Australian Green-winged Doves for companions. It used to take a great deal of notice of some Turtle-doves in the next aviary until I eventually turned in a male of one of them with it, when it entirely ignored its presence. In 1905 this bird began to lay and sit without intermission throughout the entire year. The eggs being unfertile, I was able to secure a good many, and thus supplied a desideratum to the National and other collections, but the bird wore herself out with her self-imposed labours, and died early in 1906. Unhappily, the skin was not worth preserving.

Red Ground Dove (*Geotrygon montana*).

Above bright rufous, with a purple tinge, which is more defined on the back of head, nape, sides of neck, and mantle; flights rufous-brown, more rufous on outer web and towards base of inner web; tail purplish rufous with paler tips to the lateral feathers; a pale reddish stripe from the base of the lower mandible to the ear-coverts, below the eye and underneath this a second reddish-purple band passing to back of head; throat and a band on sides of breast whitish-fawn colour; breast reddish-purple; abdomen, vent, and under tail-coverts fawn colour; under wing-coverts rufous; bill horn colour, above carmine-red at base; feet reddish-white, with dark carmine scales, barely red on the toes; orbital skin dull carmine; eyelids bright carmine; irides brownish orange-yellow. Female above dark olive, with a golden gloss; flights brown, with cinnamon base to inner web; tail olive-brown, with the base refescent, especially on under surface; forehead and cheeks rufous, the latter bounded by an olive band; throat whitish-rufous; lower throat and breast olive-brown; lower breast and abdomen buffish, more or less tinged with brown. Hab., "Tropical America in general (including West Indies), north to Cuba (accidentally at Key West), and Eastern Mexico (Mirador), and south to Paraguay, Bolivia, and Peru." (Salvadori.)

Gosse remarks ("Birds of Jamaica," pp. 321-324):—"This bird, the female of which is the least beautiful of all our Doves, is generally scattered. It affects a well-wooded country, and is found in such woods as are more choked with bushes than such as the Whitebelly prefers, though they often dwell together. It is essentially a ground Pigeon, walking in couples or singly, seeking for seeds or gravel on the earth. It is often seen beneath a pimento picking up the fallen berries; the physic nut also and other oily seeds afford it sustenance. Sam once observed a pair of these Doves eating the large seed of a mango that had been crushed. With seeds I have occasionally found small slugs, a species of *Vaginulus*, common in damp places, in its gizzard. Often when riding through the Cotta-wood, a dense and tangled coppice near Content, I have been startled by the loud whirring of one of these birds, and at the same instant its short, thick-set form has shot across on rapid wing, conspicuous for a moment from its bright rufous plumage, but instantly lost in the surrounding bushes. When on the ground it is wary and difficult of approach, but if it takes to a tree it seems less fearful, and will allow the aim of the sportsman. It is in the dry season, and particularly during the parching months that prevail at intervals from November to March, that the Partridge, as well as one or two other species of Dove is numerous in the low-land woods. In the summer it is much less frequently seen, and then only in the deep woods."

"In the Short Cut of Paradise, where the sweetwood abounds, the Partridge is also numerous; in March and April when these berries are ripe their stomachs are filled with them. Here at the same season their cooing resounds, which is simply a very sad moan, usually uttered on the ground; but on one occasion we heard it from the limb of a cotton tree, at Cave, on which the bird, sitting with its head drawn in, was shot in the very act. But at a little distance the voice is not distinguishable from the moan of the Mountain Witch.

"One day in June I went down with a young friend

into a wooded valley at Content, to look at a Partridge's nest. As we crept cautiously towards the spot the male birds flew from it. I was surprised at its rudeness; it was nothing but half a dozen decayed leaves laid one on another, and on two or three dry twigs, but from the sitting of the birds it had acquired a slight hollowness, about as much as that of a skimmer. It was placed on the top (slightly sunk among the leaves) of a small bush, not more than 3ft. high, whose glossy foliage and small white blossoms reminded me of a myrtle. There were two young, recently hatched; callow and perfectly helpless, their eyes closed, their bills large and misshapen, they bore little resemblance to birds.

"On another occasion I saw the male shot while sitting; the nest was then placed on a slender bush about 5ft. from the ground. There were but two eggs, of a very pale buff colour; sometimes, however, they are considerably darker."

Major Charles Bendire says ("Life Histories of North American Birds," Vol. I., p. 155): "Seven eggs of this species are in the U.S. National Museum collection, all taken in the West India Islands. They are oval in shape, and rather more rounded than is usually the case with Pigeon eggs. In colour they vary considerably, from a pale cream to a salmon-buff. The average measurement is 27 by 21 millimetres."

Russ observes: "From 1860 to 1875 this beautiful and delightful Dove arrived from time to time at the Zoological Gardens of London, and had already nested there in the year 1863, and after that on several occasions successfully. Reiche, of Alfeld, imported it in a considerable number in the spring of 1886. I received a pair from him for identification." "In recent times this species has only rarely arrived in the market."

In *The Avicultural Magazine*, Second Series, Vol. I., p. 231, Miss Alderson mentions a pair which she purchased at from 30s. to 35s. the pair, but she says she has since seen these Doves offered at a lower price, but is not certain that they were of the same species. It is most probable that they were.

Cuban Partridge-Dove* (*Geotrygon chrysia*).

Above chiefly cinnamon, with bright metallic purple edges to the feathers; these become duller and more golden on the lower back, rump, and upper tail-coverts; on the wings only the lesser upper coverts have purple edges; the primaries have brownish terminal margins; lateral tail-feathers with brown dots near the tips, which have whitish edges; forehead brownish-red, changing to metallic green shading to violet on the crown, back of head, and nape; a white band below the eyes and throat; reddish-brown cheek-stripes; lower throat and breast pale vinaceous tinged behind with greyish and becoming whitish on the abdomen and under tail-coverts; axillaries pale reddish; under wing-coverts cinnamon; bill red; feet pale red; irides pale brown. Female generally duller, and with a good deal of pale brown on the wings. Hab., Haiti, Cuba, Bahamas, and Florida Keys.

According to Gundlach ("Beitrage zur Ornithologie Cubas"), the habits of this Dove nearly resemble those of the "Blue-headed Quail-Dove," preferring rocky and wooded regions. He says: "I scarcely ever met them outside of the forest. In the densely-timbered portions it may be seen scratching among the leaves for food. It likes to perch on horizontal limbs, especially on limbs of the zacsas.

"Its rather doleful call-note resembles the syllables hu-up.' The nest, consisting of a slight platform of sticks, is usually placed on the top crown of certain parasitic creepers found in the more open but shady primitive forests. The eggs are two in number, of a pale ochre yellow colour, and measure 31.5 by 24 millimetres. I found nests between the months of February and July."

Mr. T. H. Newman mentioned this species to me as having been imported, and referred me to *The Avicultural Magazine*, Second Series, Vol. VII., p. 39. Miss Alderson's description of the "Black-bearded" or "Spanish Partridge-Dove" differs greatly from that of the present species, and would, I should imagine, better accord with Gundlach's "Blue-headed Quail-Dove" (*Starnœnas cyanocephala*), but I am a good deal puzzzled respecting the identity of the Black-bearded Dove, which Miss Alderson describes as rich brownish-maroon, lighter on the breast, cobalt blue cap, and dark metallic blue chin-bib, unless perchance it is *Starnœnas cyanocephala*. Nothing is said respecting metallic purple edges to the feathers of the upper parts, or of the green shot with violet on the crown and nape characteristic of *G. chrysia*, and I cannot discover that any described species of this genus has a dark blue patch on the chin; however, *G. chrysia* was identified by Mr. Newman as in Mr. Astley's collection.

Moustache Ground-Dove (*Geotrygon mystacea*).

Hind neck and mantle metallic green, becoming bright purple on upper back; lower back, rump, upper tail-coverts, wing-coverts and inner secondaries olive-brown; primary-coverts and primaries cinnamon or coffee-coloured, becoming brown towards the tips; tail above dark olive-brown, with the lateral feathers mostly cinnamon, especially towards the base; forehead brownish, shading to brownish-green; a broad stripe on the cheeks and the middle of throat whitish; a second stripe on the cheeks brown; front of neck and region of crop reddish, shot with metallic green and purple; breast pale vinous, fading to whitish on middle of abdomen; sides, flanks, and under tail-coverts pale cinnamon, the latter with paler tips; under wing-coverts cinnamon; tail below cinnamon tipped with brown; bill reddish towards base, whitish towards tip; feet clear flesh-red; irides red.

I have come across no notes respecting the wild life of this Dove, but it is not likely to differ much from that of other species in the genus. Speaking of it in captivity Russ observes:—

"In its entire behaviour this Dove is in the highest degree peculiar. Although it is palpably a Ground-Dove, it is very fond of moving about high in the branches or roosting there. Meanwhile it remains silent for a long time, hunched up and motionless on a high branch. When, however, it once raises itself it rocks its body several times, and especially the tail, up and down, scratches its eye or bill with its foot and begins to move backwards and forwards, lifting its feet high and constantly swaying its body, behaving itself quite like a Rail. Then it sees that fresh food and water have been brought, and with two or three leaps it is on the ground, where, with outstretched head and drooping tail, it trots about thoughtfully but nimbly between the food-pans. Now it begins to eat, and it is certainly no Dove's meal which it consumes, certainly not such a one as we have been accustomed to witness in the case of other Doves. First a piece of raw meat is tossed down, then it runs to a dish of hard-boiled egg and bread and takes several morsels from it, it next puts away some seed, then two or three red currants, now again a piece of meat, finally a good drink of water,

* Or "Key-West Quail Dove."

and at last it is satisfied—no wonder! Between every mouthful it has waggled its body, as if it would say, "That tastes good," and presently would begin to wrangle a little with the other Doves which approached it and drive them all away, giving them quick blows. Moreover, it so pursued a pair of wild fowl, birds of an entirely different kind, that they withdrew to the farthest corner of the aviary. It is a shame that I can procure no female for the Dove, as it is broody and keeps carrying twigs about. Breeding it would certainly be very interesting."

The above is necessarily a somewhat free translation, as Russ has a trick of abruptly changing his tenses, and in any case a strict verbal translation would sound comical in English.

The London Zoological Society first purchased four examples of this Dove in 1864, and has added others to its collection certainly as recently as 1885, if not since that date.

Mountain Witch Ground-Dove (*Geotrygon cristata*).

Interscapular region and upper wing-coverts purplish-chestnut; lower back, rump, and upper tail-coverts dark greenish blue shot with purple; primaries cinnamon, greenish-black at the tips, especially on the inner webs; secondaries and tail above blackish-green; forehead blackish-grey, shading into olive-brown towards the back; a broad, dull reddish stripe on the cheeks; throat rufescent; neck golden-green shot with purple; breast dark grey; middle of abdomen pale vinous; sides, flanks, and under tail-coverts chestnut, the latter with pale edges; under wing-coverts cinnamon; tail below brown; bill black. Female with paler thighs and under tail-coverts, as also the primaries. (Gosse.) Hab., Jamaica.

Gosse says ("Birds of Jamaica," pp. 317-320): "This magnificent bird inhabits the most retired mountains, and the deepest woody glades there; places difficult of approach and rarely traversed. In the dense and lofty forest that clothes the brow of Bluefields Peak it is very numerous, usually seen singly or in pairs, walking on the ground; the freedom of the forest there from underwood allowing it to exercise its fleetness of foot to advantage. If alarmed, it generally seeks to escape by running, its bulk and shortness of wing rendering its flight burdensome and ineffective. Its coo consists of two loud notes, the first short and sharp, the second protracted and descending with a mournful cadence. At a distance its first note is inaudible; and the second, reiterated at measured intervals, sounds like the groaning of a dying man. These moans, heard in the most recluse and solemn glens, while the bird is rarely seen, have probably given it the name of Mountain Witch."

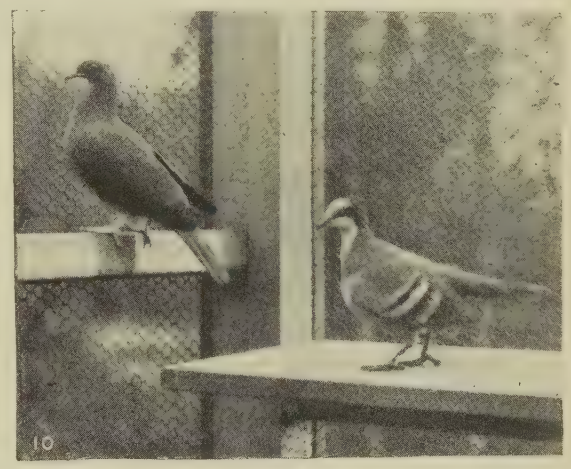
"Various seeds and nuts I have found in the gizzards of many that I have examined, some hard and stony, others farinaceous and comminuted. The seed of the lance-wood is said to afford it food."

"I had been assured by intelligent men, very familiar with these birds, that the Mountain Witch lays in March, in the angle of the roots of a tree, on the ground; that the young leave the nest about a week after they are hatched, and are led about by the mother, who scratches for them in the manner of a fowl. Some have declared that they have been eye-witnesses of this, persons who have never heard that this pigeon has any systematic affinity to the *Gallinaceæ*. I made many inquiries, and found the statement very general, almost universal. A female shot in March had an egg in the oviduct, shelled and perfectly ready for exclusion; it was of a dull reddish-white, unspotted, and measured 1¼in. by ⅞in."

The London Zoological Society first acquired this Dove in 1860, and purchased three more in 1861, and four in 1869. Russ does not mention its occurrence in any of the Continental bird-markets.

Venezuelan Ground-Dove (*Geotrygon venezuelensis*).

Above rufous-brown; mantle purplish-blue; lesser wing-coverts tinged with purple; primaries slaty-brown; forehead rufous, becoming vinous on the crown and on the centre of the back of the head into purplish-vinous, bounded at the sides by grey; back of neck purplish-brown; sides of head whitish, rufous towards base of lower mandible; a blackish line below the cheeks; throat whitish, changing to dull greyish-vinous at back of throat and front of breast; rest of under-surface reddish-brown, becoming much whiter in centre of abdomen; flights below greyish-brown; under wing-coverts brown, the greater ones somewhat greyish; tail below brown, darker towards tip of inner webs; irides brownish-yellow. Female not differentiated. Hab., Venezuela.



Bleeding-heart and Barranquilla Pigeons.

I have not been able to find any field-notes relating to this pigeon. Six specimens of it were presented to the London Zoological Society by Captain Pam on August 11th, 1909.

Bleeding-heart Pigeon (*Phlogœnas luzonica*).

In the cock bird the crown of the head is bluish ash-grey; the back of the neck purplish maroon; the remainder of the upper surface is of a bronzy greyish-brown, shot with emerald green; the upper wing-coverts are shaded with crimson, and broadly tipped with pale bluish ash-colour; the shoulder clouded with the same colour; the primaries and secondaries slightly rufous tinted on outer web; the throat pure white; the breast with a deep blood-red central diffused patch, the remainder of the breast being stained with pale salmon, which also tints the front of the belly; the sides ashy-brown, changing into olivaceous clay-brown on the belly; the feathers round the vent white, stained with pale sandy-brownish round the sides, the under tail-

coverts being also of this colour; tail below ash-grey; feet dull crimson; bill black; iris plum-coloured.

The hen is slightly smaller than the cock, has the forehead less inclined to white, and the crimson heart on the breast smaller.* Hab., Luzon, Philippine Islands. I purchased a pair of this bird on August 10th, 1897, and turned them out into my longest covered aviary with numerous small Finches, Waxbills, and several tiny Doves. Dr. Russ says that this species is malicious towards its own kind and all smaller feathered things —a gross libel upon this beautiful bird, for the only thing it ever attacked in my aviary was a hen Steel-barred Dove (*Columbula picui*), which, having had its wing broken when originally captured, flew heavily. When pairing, it would indeed chase other small doves off the floor, but it never attacked them on the branches, and Finches it utterly ignored. After the death of its hen, on October 13th, 1899, it frequently squatted down on the earth in the sun with a hen Chinese Quail sitting almost under its wing.

When showing off to the hen the Bleeding-heart suddenly stops in its race after her, throws back its head, puffs out its chest, droops tail and wings, and gives utterance to a number of staccato *hoos* rapidly repeated. At times, when the hen persistently evaded the cock, he used to lose his temper, and, like some other Doves, clapped his wings above his back, producing a sharp sound like the crack of a whip; this always seemed to alarm the hen.

I hung up a basket-lid high in the aviary, hoping that my birds would breed—they used often to roost there at night; but, although pairing occasionally took place, no eggs were deposited.

During the day, this and other species of *Phlogœnas* spend most of their time on the ground, racing to and fro with bobbing head, but at night the Bleeding-heart Pigeon roosts as high up as it can get and before settling down it keeps flying backwards and forwards between the earth and a branch, until it is weary. Like most species of Doves, it is much alarmed by any form of ladies' head-gear, and rattles tempestuously about the aviary, to the great terror of the smaller inhabitants. The cock bird died in December, 1900, and I have never purchased others. It first reached the Regent's Park Gardens in 1861, and many others have been purchased, received in exchange, or presented since that date. In 1887 five examples were bred in the Gardens.

In *The Avicultural Magazine*, Second Series, Vol. I., pp. 132, 133, Miss Alderson published some notes on specimens in her collection, and published an illustration of young in the nest. She successfully reared three out of many that were hatched. This lady kindly sent me the body of one dead young one for my collection. It has the usual barred character of many of the Doves.

Bartlett's Pigeon (*Phlogœnas crinigera*).

Head, back and sides of neck, and mantle dark metallic green, shading into purplish-chestnut on the back, scapulars, rump, and upper tail-coverts, the feathers of the latter more or less edged with green or pink: lesser upper wing-coverts grey edged with bronze-green; the rest of the upper coverts brownish-chestnut broadly tipped with grey, excepting on the median coverts, where the tips only show small grey spots; primaries brown, secondaries chestnut; central tail-feathers brownish-chestnut, lateral feathers grey, with sub-terminal black belt; throat snow-white; a broad patch of stiff, hair-like, deep red feathers on the upper breast; rest of under-surface buffish-brown, becoming paler on under tail-coverts and almost white on middle of abdomen; bill black; feet dull carmine; irides lilac. Female smaller; crown of the head duller and darker; bill more slender when viewed in profile. Hab., Mindanão, Basilan (and Sulu Island?).

Very little is recorded respecting the wild life, but Mr. Goodfellow writes to Mr. Newman that they "are by no means common in their own country, and are very locally distributed around the somewhat drier parts of the coast lands." "They are forest birds, but do not perch in the trees." Mr. Newman adds: "They doubtless roost and nest in bushes and low trees at no great distance from the ground."

Four examples of this very beautiful Bleeding-heart Pigeon were purchased for the London Zoological Society in 1863, and in 1864, 1865, and 1867 young were bred in the Gardens. Dr. Sclater describes the nidification as follows ("Proceedings of the Zoological Society," 1865, p. 239):—"As I have already stated, four specimens of this beautiful pigeon were purchased by Mr. Bartlett at Liverpool, in August, 1863. In the following spring the single male paired with one of the three females, and bred five times during the summer of 1864. The female deposited only one egg on each occasion, making a very slight nest of small sticks in a flat basket placed 8 ft. above the ground in the Western Aviary. The period of incubation was fifteen days. Two of the young birds were successfully reared, and are now in adult plumage; two others died immature, and are now in the British Museum. On the remaining occasion the egg was addled."

In 1907 Mr. T. H. Newman purchased a pair (imported by Mr. W. Goodfellow) from Mrs. Johnstone, and successfully bred a young one. Unhappily, he subsequently lost the entire family. He gives a very complete and fully-illustrated account of the species in *The Avicultural Magazine*, Second Series, Vol. VII., pp. 225-235.

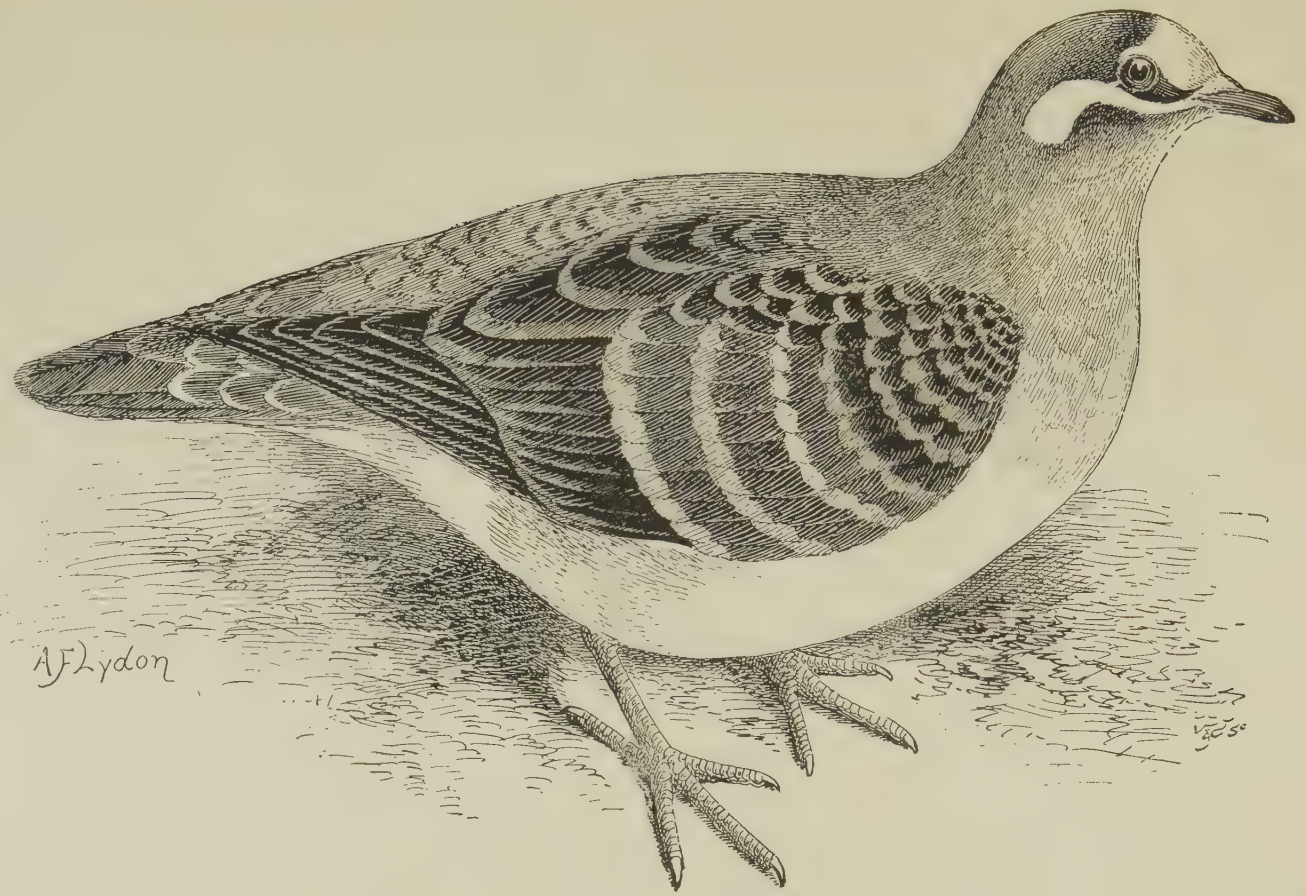
Stair's Ground-pigeon (*Phlogœnas stairi*).

Glossy brown, shot with bronze and purple; back of head and neck dark slate-coloured, shot with green; back and wings shot with magenta; lesser upper wing-coverts edged with purple; flights and tail feathers brown, the laterals deep vinous-grey at base; forehead, sides of head and neck, and breast vinaceous-rufous, becoming white on the throat and round the breast; the breast bounded behind by a deep maroon band; feathers at sides of breast edged with purple; middle of abdomen vinaceous brown; sides, vent, and under tail-coverts coffee-brown; under wing-coverts and base of inner webs of flights cinnamon; bill black; feet deep crimson; irides reddish-brown. Female smaller, with a shorter bill; the forehead and breast wholly dull pale chocolate; back of crown darker; back and wings washed with olive; abdomen brownish-ash, with no defined broad dark maroon band between it and the breast; tail paler than in the male, the lateral feathers redder and with a subterminal brown bar. Hab., Fiji and Tonga Islands.

Mr. E. L. Layard says ("Proceedings of the Zoological Society," 1875, p. 438):—"Unlike any other Pigeon of these islands, it seeks its food entirely on the ground. Here it runs as quickly as a Quail, springs to its wings on the least alarm, and glides through the underwood to a place of safety with the rapidity of lightning.

"Mr. Kleinschmidt has kept it in captivity for a long period; but it is so timid that on the approach of anyone to its large cage it instantly runs into a corner and crouches down, just as a Quail or other game

* Miss Alderson says that the crimson on the breast varies in extent in individuals apart from sex, and this doubtless is so, but, taking one with another, I believe there is always less of it in the females.



Bronze-winged Pigeon (Cock).

bird would do. The natives call it Ngilu (written in the missionary jargon 'Qilu'). It breeds in low bushes, making a flimsy nest, never out of the reach of a man's hand, and lays two eggs, white; axis 1″ 3‴, diam. 10‴."

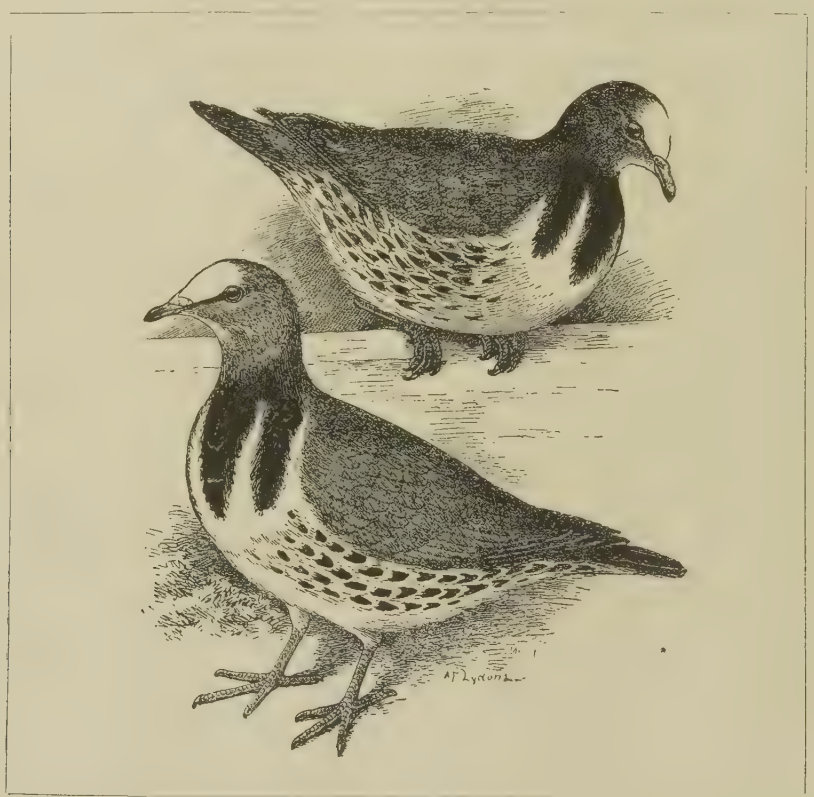
Although Russ does not mention this species in his work, it has been represented in the London Zoological Society's collection more than once, and recorded both in the 8th and 9th editions of the "List of Animals."

Wonga-wonga Pigeon (*Leucosarcia picata*).

The upper surface, including the wings and tail, of the adult bird is leaden-grey, quills dark brown, outer brown; the white bands from the shoulders across the sides of the breast broader, and the black spots on the under surface more numerous, often divided into pairs (on each side of the shaft), characters noted in living female. Hab., Eastern Australia, from Rockingham Bay, through the interior, to Victoria.

Tolerably abundant in the brushes of New South Wales, where the woods, according to Dr. Ramsay, resound with its monotonous, deep, and melancholy call. It frequents both dry and damp localities, is strictly a ground feeder, only taking to the trees when disturbed. It lays two comparatively small white eggs.

For many years I coveted a pair of this species, but



The Wonga-wonga Pigeons.

tail feathers white tipped, the forehead and chin white, the lores black, an indistinct whitish line under the eyes and on the ear-coverts; cheeks pale grey, gradually deepening downwards and continuous with the leaden-grey of the breast, which is divided by a broad semi-circular white belt; chest white in the centre, feathers of flanks and abdomen white-edged and with triangular black subterminal spots; under wing-coverts dark grey, with whitish edges; under tail-coverts brown, washed with buff and edged with whitish; feet crimson pink, bill purplish towards the tip, flesh-pink towards the base and on the cere; iris dark brown, the eyelashes crimson. Female apparently longer in the tarsus, the forehead of a less pure white hue, and stained behind with

had I known I should never have indulged my fancy. I purchased a pair on March 25, 1905, and turned them out into my larger outdoor aviary. There they built two nests in a small fir tree, but laid no eggs. The cock sang from dawn to dark, with hardly any intermission, and as the performance consists of a measured repetition of a perfectly monotonous penetrating *hoo-hoo-hoo-hoo*, sometimes one or two hundred times without a pause, it may well be understood how my neighbours blessed me. Eventually, in September, I brought the pair indoors and turned them into one of my bird-room aviaries, at the back of which, near to the ceiling, was a platform of branches and sticks, about a foot wide and six feet long. There the hen laid four or five

NICOBAR PIGEONS.

eggs without making any proper nest, and, of course, nearly all of them fell through the interstices and were smashed. The hen made some attempt to incubate those nearest the surface, but without result. About November 18 she was taken ill and died on the 22nd. On the 27th I exchanged the cock bird for two pairs of Cockatiels.

After chasing the hen, the cock bird often flew up to a lofty perch and sat pitching forwards and rhythmically tilting his whole body forwards, evidently as an invitation to the hen to approach him. I noted the same trick later with other Australian Pigeons.

The Wonga-wonga Pigeon first reached the London Zoological Gardens in 1859, and bred there the same year. It has bred repeatedly since then; in fact, I saw a hen sitting the last time I visited the collection. Why my hen did not lay when out of doors I cannot imagine, but perhaps it is as well that she did not, as I might have found it rather difficult to dispose of the young birds.

BLUE-HEADED PIGEON (*Starnœnas cyanocephala*).

Above olive-brown; nape and mantle more olivaceous; crown dull blue, bordered with black; a broad white band from chin, below eye, to back of head; throat and chest black, bordered behind by a semi-circular narrow black stripe edged with black, the front and sides of the black area tipped with blue; remainder of under surface dull ferruginous, the breast tinged with purple; bill coral-red at base, bluish-grey at tip; feet dull reddish-white, with the tarsal scales bright carmine and those of the toes deep bluish-red; the skin at the joints of the toes sky-blue; irides dark brown. Female not differentiated, but probably smaller and duller. Hab. Cuba and Florida Keys.

According to Gundlach this species "is not uncommon in the extensive forest, especially in such in which the ground is rocky, but is scarcely ever found in cultivated fields or open prairie country. It moves slowly, with the neck contracted and tail erected, while searching for food among the dead leaves on the ground. This consists of seeds of various kinds, berries, and occasionally small snails. After feeding, it usually flies into a tree, and perches on a leafless horizontal limb, or on one of the leafless parasitic vines, to rest. In the early mornings, should its plumage, perchance, have become wet while travelling through the dew-laden shrubbery, it selects a sunny spot to dry itself. From time to time this Dove utters its call-note, consisting of two hollow-sounding notes—"hu-up"—the first syllable long drawn out, the second short and uttered very quickly. Besides this note a low muttering is occasionally heard. Its call-notes are deceptive, appearing near when distant, and distant when close by. Its flight is noisy when starting, like that of the European Partridge, from which it receives its misleading name—"Perdiz."

"It nests in April and May; the nest is a simple affair, consisting of a few twigs. It is usually placed in the tops of parasitic vines—*Tillandsia*. It lays two white eggs, measuring 35 by 25.5 millimetres."

The London Zoological Society first purchased two examples of this pigeon in 1864, and has, from first to last, possessed quite a number of examples, the last recorded in the ninth edition of the List of Animals having been presented in 1887; it bred in the Gardens in 1870. In the Amsterdam Gardens this species was represented as long ago as 1854; Russ and Landauer both possessed single examples purchased from German dealers, and Russ says that at the "Ornis" Exhibition of 1893 the price asked was only eight marks for a pair.

HACKLED PIGEONS
(Sub-family Calœnadinæ).

This group is characterised by the long, narrow, hackled feathers of the neck; the feathers on the head are short, and give these birds a naked aspect; the powerful hooked bill and strong feet, with formidable curved claws, produce altogether a remarkable Vulturine-looking type, and remind one somewhat of the Vulturine Guinea-fowl. In captivity they should be fed upon maize, wheat, dari, and hemp; they are especially fond of maize.

NICOBAR PIGEON (*Calœnas nicobarica*).

The adult male is metallic green, with golden coppery reflections, the under parts duller and bluer; the feathers on the hind neck long, narrow and tapering, like those of Guinea-fowls; head, neck, and front of breast with close, hair-like feathers, and blue-black; quills black, with blue outer web, below brownish; longer upper tail-coverts, tail and under tail-coverts pure white; feet crimson, powdered with white, and whitish at the back, claws ochreous; bill black, a knob just behind the nostril on the culmen; iris hazel.

The female is slightly smaller, and sits less erect than the male; the neck-feathers are somewhat shorter; the bill viewed in profile is much more slender, and the frontal knob at the base of the upper mandible is small and little developed; the plumage generally is duller, less varied with metallic golden copper above, and with gleaming emerald green below. Hab., Nicobar Islands and Mergui Archipelago, through the Malay islands, eastwards to the Solomon group.

In an article on birds from Duke of York Island and New Britain ("Proceedings of the Zoological Society," 1879, p. 14), Dr. Otto Finsch says that the native name for this species is *Parreparre*.

Dr. Guillemard ("Proceedings of the Zoological Society," 1885, p. 576) describes the soft parts thus: "Iris greyish pink; bill black; tarsus dark coral red; soles of feet yellowish," from Obi. At p. 663 he describes them as follows:—"Iris dull red, or reddish brown; bill and cere black; feet dull reddish, yellowish beneath," from Waigiou and Salwatti. It would therefore seem that, as with many other birds, the colouring of the soft parts is of local significance.

Speaking of it as observed in the Nicobars, Mr. Hume observes ("Nests and Eggs of Indian Birds," Vol. II., pp. 365, 366):—"Its home, its breeding headquarters, which we had the good fortune to discover, are in the little, almost absolutely inaccessible island of Batty Malve.

"Of this I said in my account of our cruise amongst the Nicobars ("Stray Feathers," Vol. II., p. 95):—'The island appeared to be almost wholly composed of coral, resting unconformably on a base of sandstone. It was low, nearly level, bore a certain amount of high tree-jungle and a few patches of cocoanut, and was in most places covered by an excessively dense undergrowth of some thorny, bramble-like shrub, here and there interspersed with a few open plots of grass. The moment the level of the island was gained the mystery of the black birds was solved—they were Nicobar Pigeons, and this was *par excellence* the home and stronghold of this magnificent bird. Thousands were flying about from tree to tree or feeding on the seeds of the undergrowth (with which we found their crops mostly full). Their nests were as thick upon the trees as ever nests are in a rookery at home. Young ones in every stage of growth, from naked blind things to birds fully fledged, were to be seen in or alongside the

nests. They were perfectly tame at first, and fed upon the ground just like other Doves. Though silent birds as individuals, yet from their immense number their occasional *croak, croak* blended into a continuous murmur heard distinctly above the grinding surf.

"'Hundreds might easily have been shot. As it was, the whole party, native and European, were loaded; and, despite unavoidable losses at the time of re-embarking, some seventy were safely brought on board.'

"Mr. Davison, who was one of the party, and zealously climbed numbers of the trees to scrutinise the nests more closely, has remarked: '*Calœnas nicobarica* builds a regular pigeon's nest, and always on trees; on Batty Malve, where we found this bird in thousands, almost every thick, bushy tree contained several nests. I counted thirteen on one tree, and I must have examined a couple of dozen of these nests. We visited the island rather late. Nearly all the occupied nests contained young, and hundreds of young had left the nest. I only succeeded in finding two eggs—one partially incubated, the other ready to hatch off—the former of these unfortunately got broken on the island, the latter I succeeded in preserving by cutting a hole in one side, and then placing the egg in a small paper tray near an ants' nest. The nests were, as I have mentioned above, regular Pigeons' nests—merely a platform of twigs, very loosely and carelessly put together, and without lining of any kind, and in no single case contained more than one young one or one egg; so I think we may safely assert that the normal number of eggs laid by this bird is only one."

Mr. Hume describes the egg as follows:—"The egg is, of course, spotless and pure white, but the shell, though compact, is very finely, almost microscopically, pitted all over, and it has scarcely a trace of any gloss. It measures 1.84 by 1.27."

The London Zoological Society first acquired this species in 1864, when six specimens were presented; it was bred in the Gardens in July, 1865, May and July, 1866, July and August, 1868, and June, 1870; it bred again in September, 1889. It has also been bred freely by Mr. Meade Waldo. I purchased a pair on July 5th, 1897, and placed them in my outdoor aviary, where they sat out under the open wire netting summer and winter, only flying down under cover to feed. In severe weather the snow piled up on their backs as they roosted, and they took no notice. I never heard them utter a note beyond a gruff sort of grunt, like the surly "*wuff*" of a large dog when irritated.

Beautiful as the Nicobar Pigeon is in colour, it is hardly graceful either in form or action; it is also an arrant coward and bully; my birds were so nervous when I first received them that when I entered the aviary they flew about recklessly, not looking to see where they were going; the cock bird one day broke a wing in its frantic efforts to get away from me, and had perforce to sit quietly on a box for a fortnight before he could use the wing again. I think this somewhat sobered him, but he continued nervous and excitable for some time. He took no notice of his hen at any time, excepting to peck her and utter an angry grunt if she settled on the branch near him.

Eventually I brought these birds indoors, and placed them in one of the smaller of my covered aviaries, giving them the top of a hamper supported high up in a corner to induce them to breed, but they never made the slightest attempt to reproduce their kind. The female died on Jan. 18, 1902, and the male, I think, about two years later. The taxidermist omitted to insert the date on its label.

The Nicobar Pigeon is an exceedingly handsome bird as regards colouring, but it is so apathetic that one soon wearies of it; moreover, to see it to perfection a very large aviary is required.

I agree with Dr. Russ that the *Gouridæ* are altogether too large to be suitable either for the bird-room or aviary; in fact, a Pigeon the size of a Turkey is, as he states, only fit for Zoological Gardens or Parks. I therefore shall follow his excellent example, and not include the Crown-Pigeons in the present work. Three species have been represented at the London Gardens—*Goura coronata, G. sclateri,* and *G. victoriæ;* they are most majestic birds.

LITTLE DODOS (*Didunculidæ.*)

Characterised by a hooked bill, the lower mandible serrated near the tip, which is truncated, the nostrils oblique; the front of the tarsus very imperfectly scaled. The family consists of one species occurring on the Samoan Islands. In captivity it would probably be most suitably fed upon banana, potato, apples, etc. It will however, also eat bread, almonds, hemp-seed, etc.

Tooth-billed Pigeon (*Didunculus strigirostris*).

Head, neck, and mantle metallic blackish-green, the feathers of the two last somewhat greyish on the edges; back, rump, upper tail-coverts, wings, and tail chestnut; base of tail-feathers blackish-brown, especially on the inner webs; flights above, excepting the inner secondaries, brown; chin, throat, and upper breast metallic blackish-green; lower breast and abdomen brownish-black; under tail-coverts brownish-chestnut; flights below greyish-brown; under wing-coverts brown; bill orange; base of under mandible cinnamon-red; feet ochreous red; naked orbital skin fleshy-red; irides brown. Female not differentiated. Young brown, with crescentic rufous bands on feathers of upper parts and breast. Hab., Upolu, Savai, and Tutuila.

According to Russ, this Pigeon has the power of moving the upper mandible like the Parrots. In 1865 Professor Newton exhibited an egg of the Tooth-billed Pigeon at a meeting of the Zoological Society, and the same year the second volume of Gould's "Handbook to the Birds of Australia" appeared, in the Appendix to which, pp. 557-560, a full account of this singular pigeon is published. From this I cull the following:—"It is named by the natives 'Manu-mea,' or Red-bird, from the most predominant colour of its plumage being chocolate-red. It was formerly numerous, and we may therefore be surprised that it should not have been seen and procured by the early navigators; now it is nearly extinct. It feeds on plantains, and is partial to the fruit of the 'Soi,' a species of *Dioscorea,* or yam, a twining plant abundant in the islands, and producing a fruit resembling a small potato. In disposition it is exceedingly shy and timid. Like the Ground-Pigeons, it roosts on bushes or stumps of trees, and feeds on the ground. It also builds its nest in such situations. During the breeding season both parents aid in the duty of incubation, relieve each other with great regularity, and are so intent on the performance of their duty that, when sitting on their eggs, they may be easily captured by the hand. Two living birds were obtained in this way by Mr. Stair. They are also taken by the natives with birdlime or springes, and shot with arrows, the sportsman concealing himself near an open space in which a quantity of the 'soi,' their favourite food, has been placed.

"The first living bird obtained was accidentally killed; the second, when placed in confinement, at first was sullen and refused food, but soon became reconciled to captivity and throve well. The natives fed it upon

boiled taro (the root of the *Caladium esculentum*), rolled into oblong pellets, in the same manner as they fed their pet Wood-Pigeons and Doves. The power of wing of most of the Pigeon tribe is very great, and it also obtains in this bird. It flies through the air with a loud noise like the Topknot Pigeon (*Lopholaimus antarcticus*) of the Illawarra district, and many others of the Australian Pigeons; and Mr. Stair describes it as making so great a noise with its wings on rising that, when heard at a distance, it resembles the rumbling of distant thunder, for which it might be mistaken. Mr. Stair considers that the bird may yet be found at Savaii, the largest and most mountainous island of the group, but thinks it does not at present exist on that of Upolu."

The first example of this rare Pigeon to reach the Gardens at Regent's Park was presented by Dr. G. Bennett in 1864, a second was presented in 1874, and a third was purchased in 1876; the last recorded in the ninth edition of the "List of Animals" was presented in 1887.

So rarely does this bird come to Europe that Dr. Russ says that it has no meaning at present for aviculture, but he hopes it may eventually arrive in greater numbers, in which case it will be of the highest interest. I am afraid that hope is destined never to be realised.

This bird, then, brings my task to a conclusion, and I can only regret that, however much pains one may take, and however zealously one may work, the rapid yearly influx of new forms renders it impossible to make a work of this kind absolutely complete. However, up to the end of 1908, I think very little is lacking, excepting those species which, being now unattainable, were purposely omitted, and I believe, as stated in my Preface, the Doves are complete up to the end of 1909. The majority of the new forms imported in 1909 have been secured and brought home by collectors specially sent out by wealthy aviculturists and the London Zoological Society; consequently it is probable that many years must pass before they are likely to be offered for sale in the open markets of Europe, if, indeed, the ever-growing mania for excessive bird-protection does not ere long put a stop altogether to aviculture, and thus inflict a severe blow upon biological science by greatly narrowing the circle of students of bird-life.

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Black cheeked Lovebird	Agapornis nigrigenis.	Tanganyika Rs. N. Rhodesia
~~Red faced Lovebird~~ (Sold)	~~Agapornis pullaria~~	~~Western Africa.~~
Peach faced Lovebird	Agapornis roseicollis	S.W. & S.E. Africa.
Fischers Lovebird.	Agapornis	
Masked Lovebird		
Crimson-winged Parrakeet	Ptistes erythropterus.	N. & E. Australia
Indian Ringnecked Parrakeet.	Palaeornis torquata	India, Ceylon etc.
Alexandrine Parrakeet.	Palaeornis	
~~Cockatiel (Sold)~~	~~Calopsittacus novae-hollandiae~~	Australia.
Red-billed Toucan	Rhamphastos Erythrorhynchus	Guiana & Amazon Bra
White breasted Toucan.	Rhamphastos Vitellinus	Trinidad, Venezuela
		Guiana & Lower Amazon
Stanley Parrakeet.	Platycercus icterotis	S.W. Australia
Royal Sterling	Cosmopsarus regius	Abyssinia
Spreo Starling	Spreo pulcher, (superbus)	Abyssinia
Spot-billed Toucanet (new).	Selenidera maculirostris.	S.E. Brazil
Swainsons Lorikeet	Trichoglossus novae-hollandiae.	E. Australia
Cross Barbets	Lybius torquatus	S. Africa
Blue-throated Barbet	Cyanops asiatica.	Himalayas
Fire-tufted Barbet.	Psittenteles versicolor	N. & W. Australia
Versicoloured Lorikeet.		